THE POLITICAL ECONOMY OF DISTRIBUTIVE CONFLICT: A COMPARATIVE ANALYSIS OF THE DETERMINANTS OF STRIKES AND WAGE INFLATION AMONG THE GROUP OF TEN

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Chapter 1

Introduction

Starting in the late 1960s, both the incidence of strike activity and the rate of inflation - measured either by wages or prices - showed signs of substantial increase in virtually every member of the Group of Ten.[1/] (The relevant details are presented in Figures 1.1 and 1.2.) Reference to the strike frequency figures[2/] plotted in Figure 1.1 indicates the existence of two distinct strike waves occurring across the diverse industrial relations systems of the Group: the first in 1970-71; the second in 1974. Further, reference to the wage inflation figures plotted in Figure 1.2 depicts a broadly similar pattern, with evidence of pronounced wage escalations in most Group of Ten nations over the periods 1970-71 and 1974-76.

As joint outputs of the process of collective bargaining these wage and strike developments are obviously related. This much is beyond dispute. However, consensus rapidly evaporates as soon as attempts are made to move beyond the simple assertion of the existence of a relationship, and towards the attribution of a dominant line of causality. The problem is that the broadly contemporaneous occurrence of wage and strike 'explosions' is equally consistent with at least three distinct lines of causality. The first, running directly from strikes to wages, carries the implication that trade union action is capable of causing upward pressure on the pace of wage change independent of the state of the labour market. The second, running from wages to strikes, is consistent with an essentially reactive role for trade unions concerned about the impact of wage inflation on wage structure, and eager to protect their relative wage position. The third line of causality, that both wage inflation and

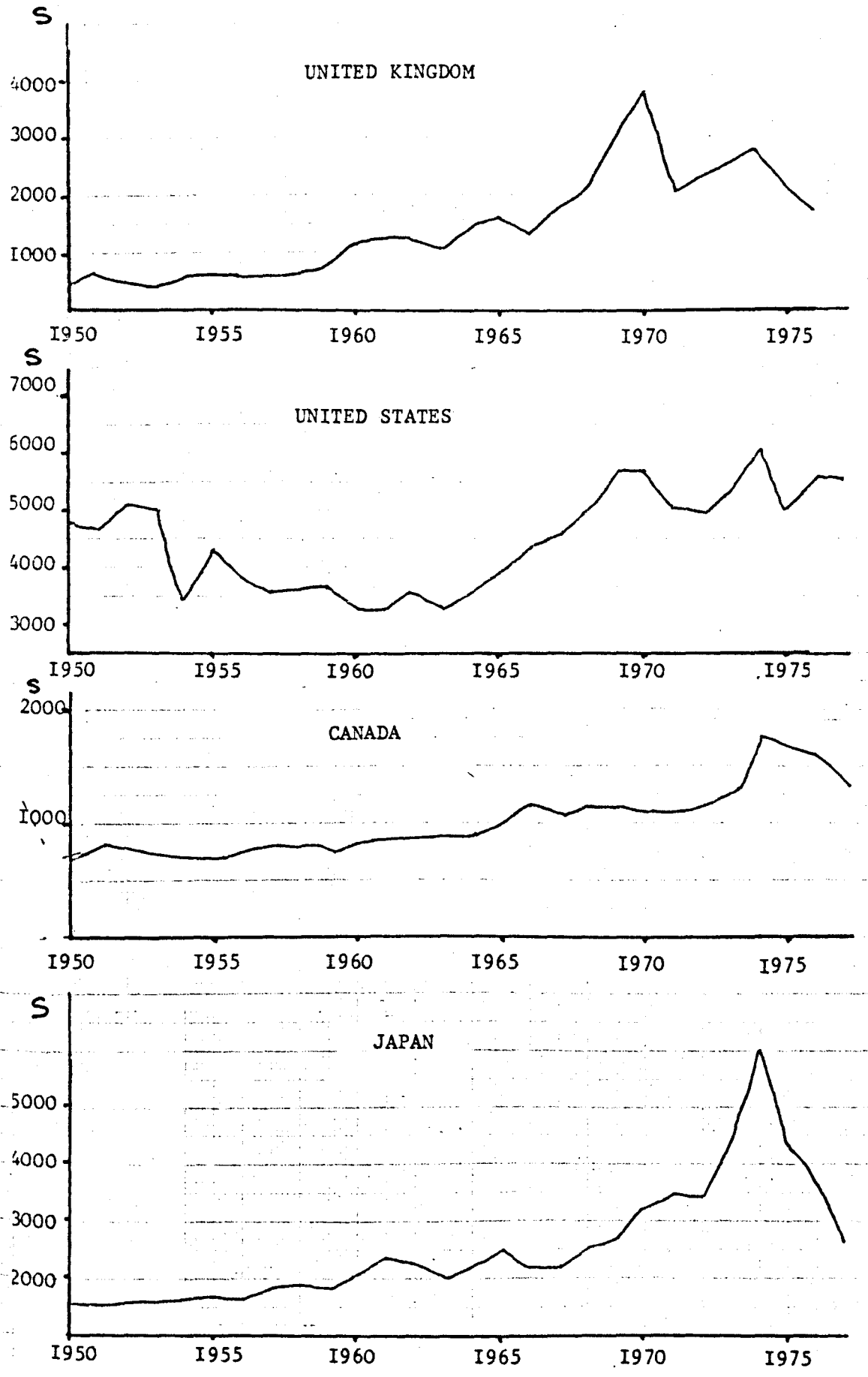
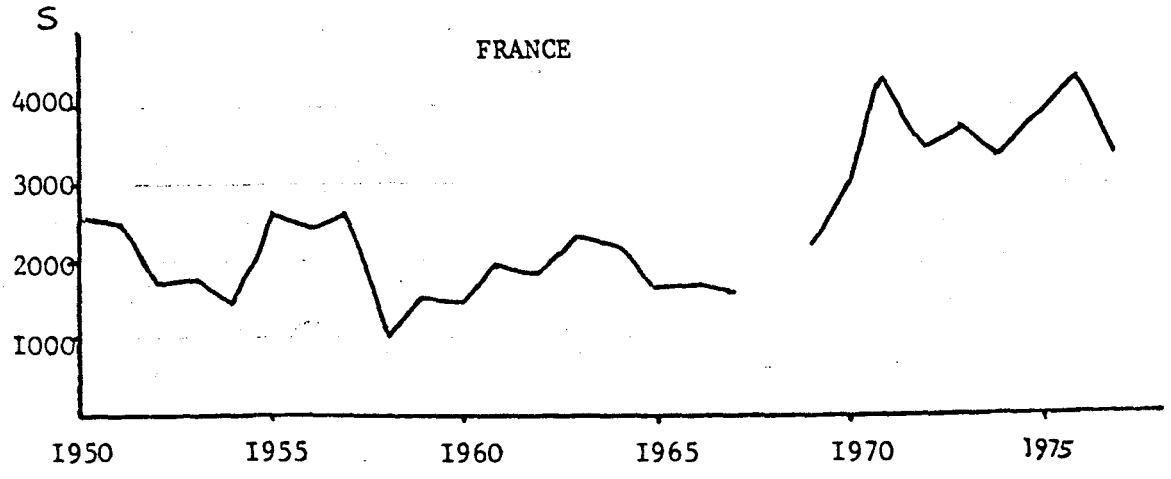
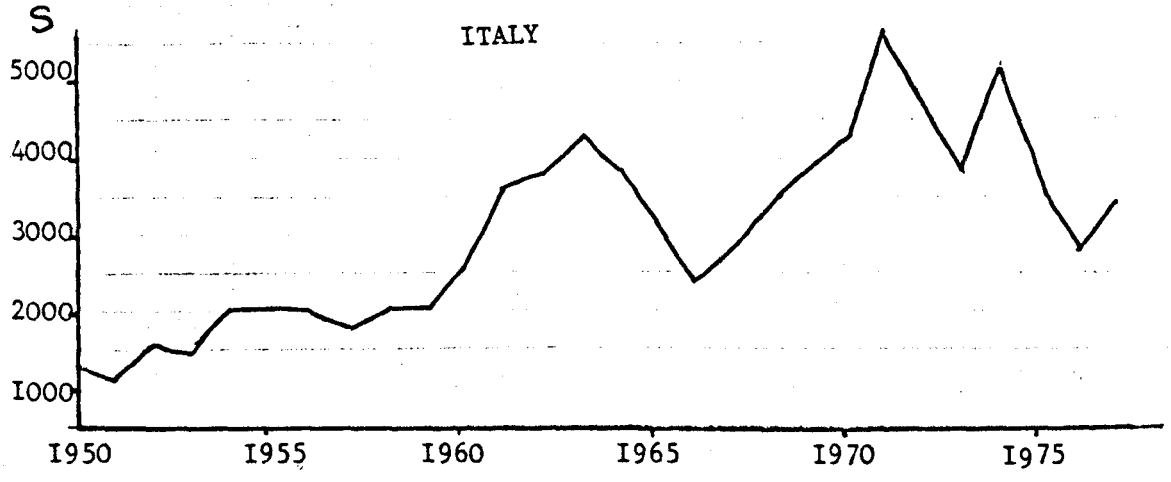
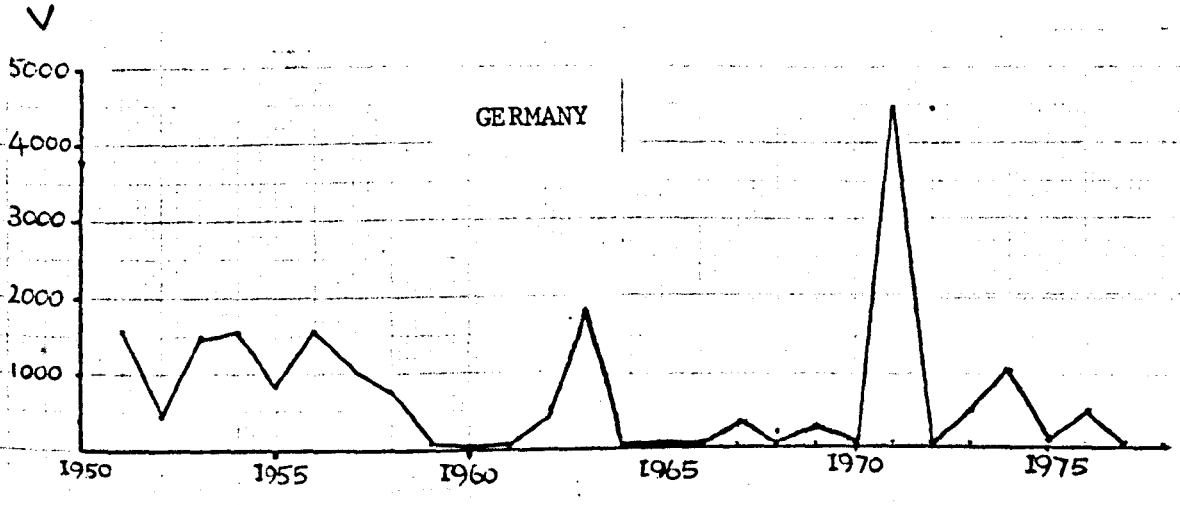


Figure I.I

Post-war aggregate strike frequency: The Group of Ten.







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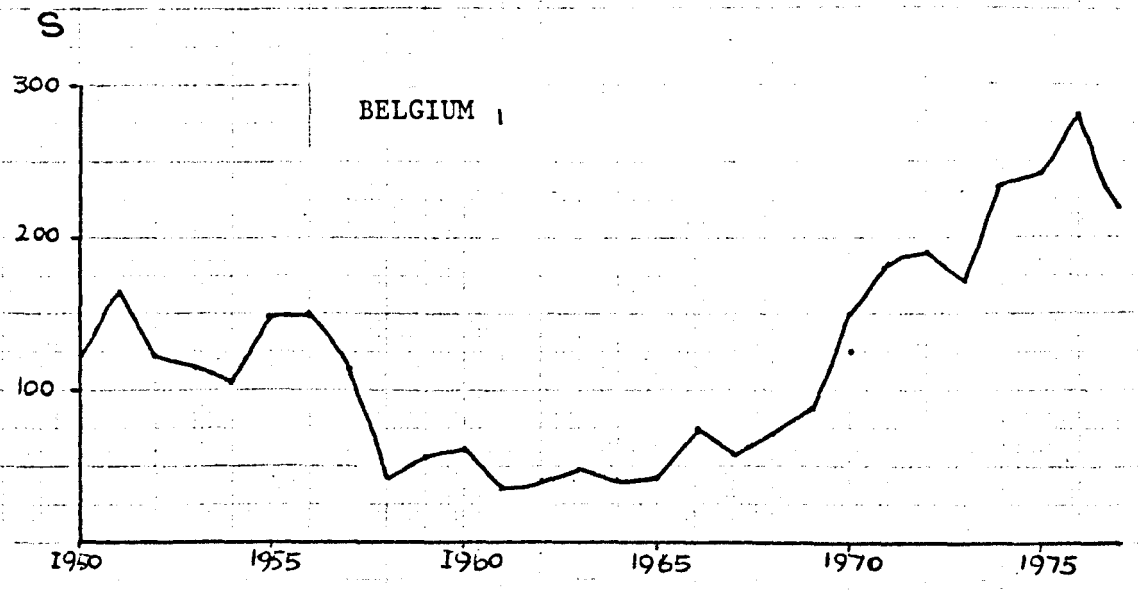

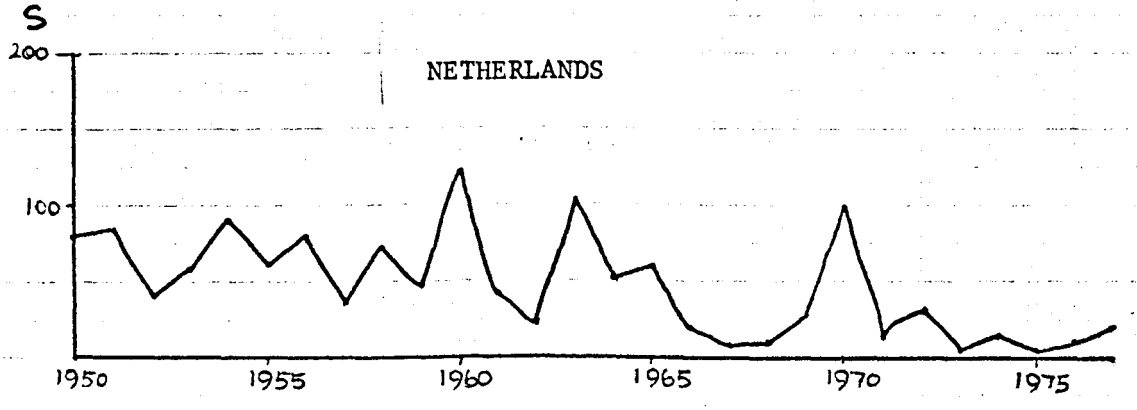

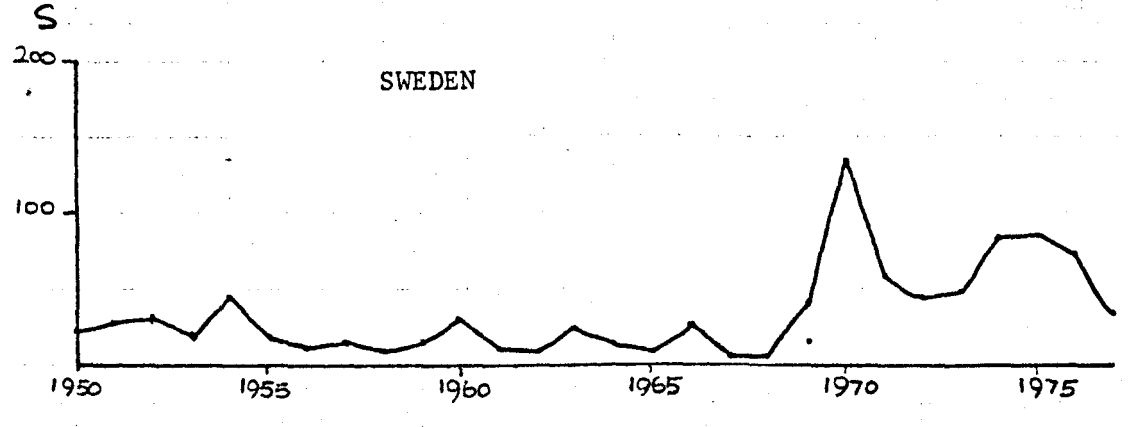

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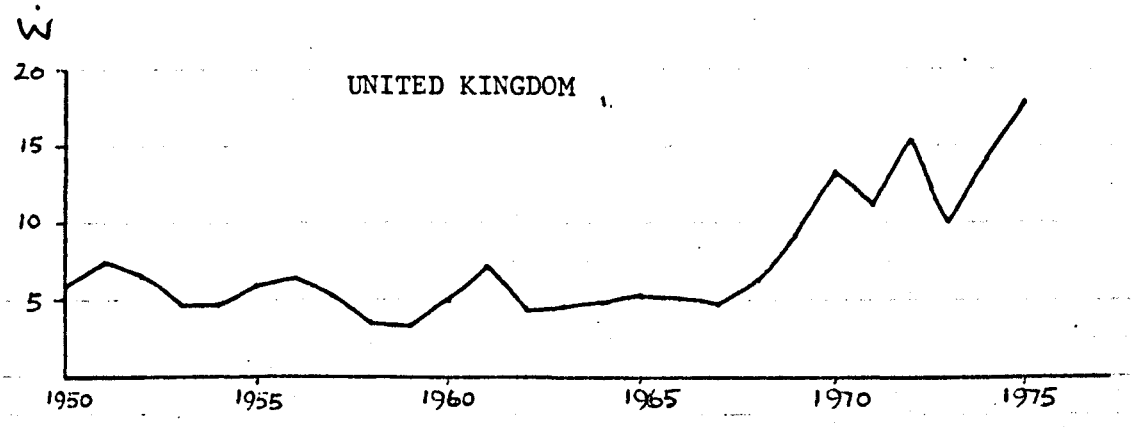
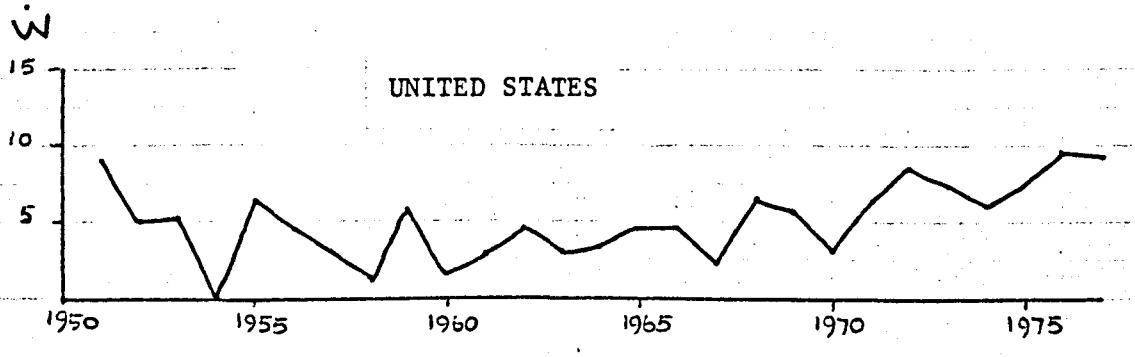
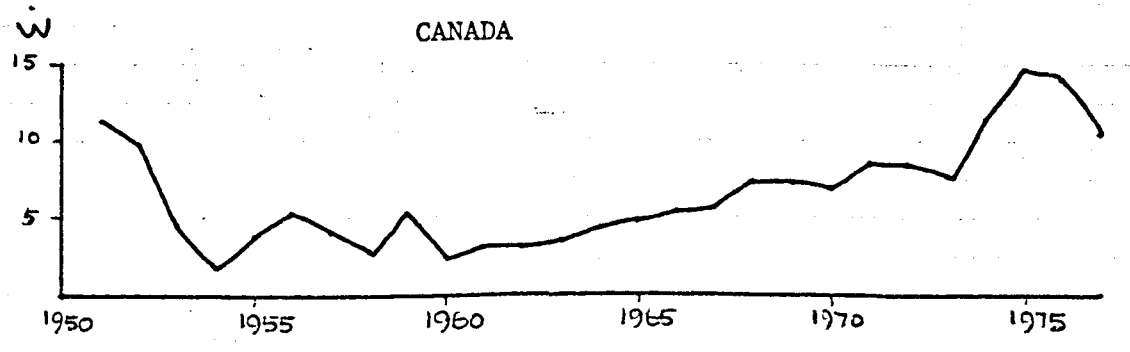






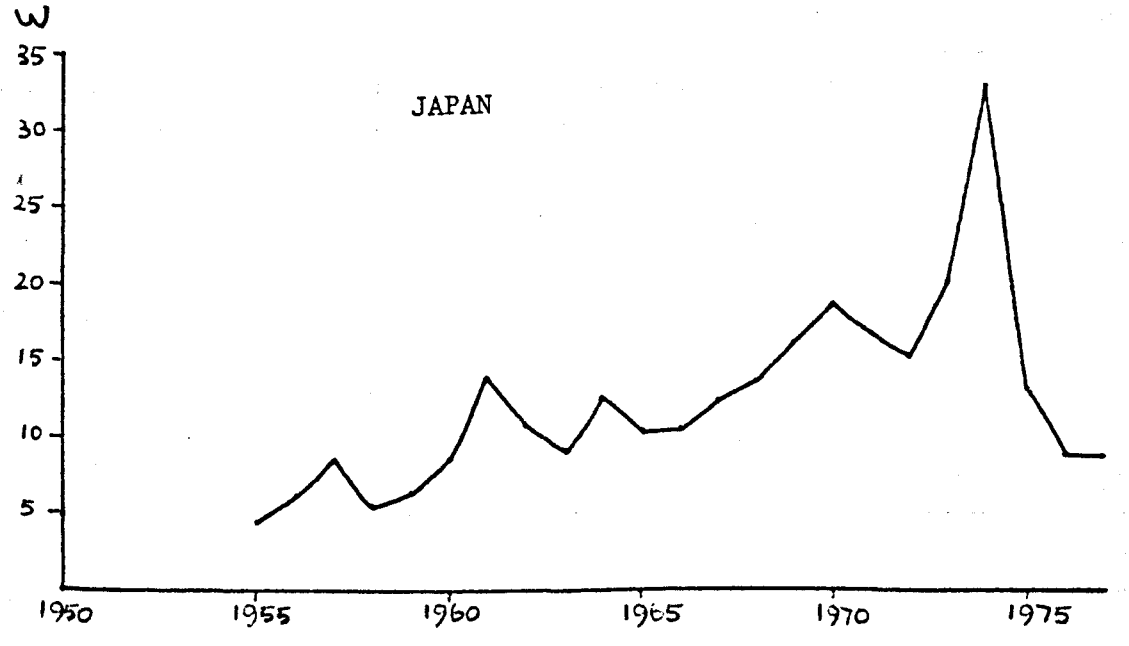
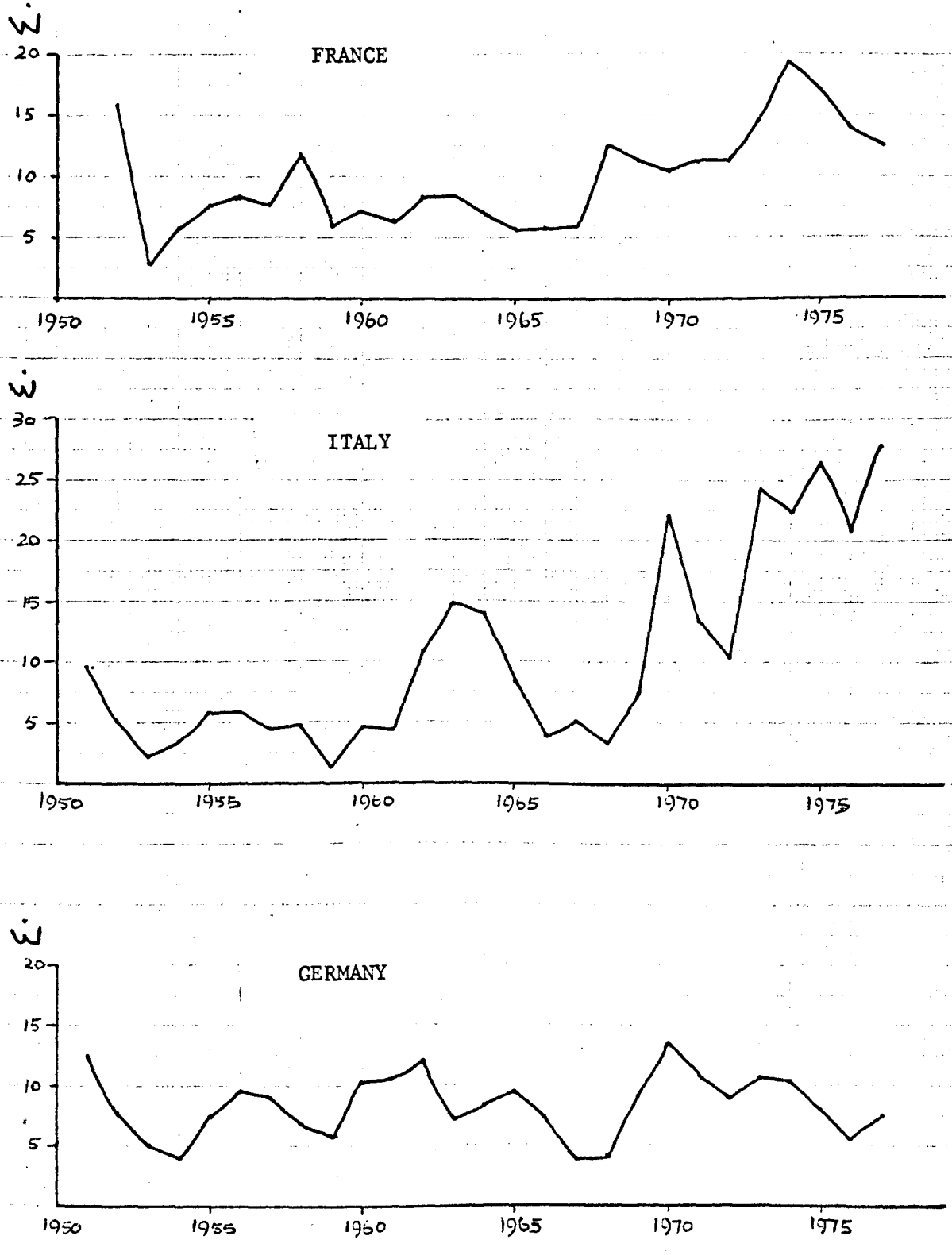


Figure I.2

Post-war wage inflation in manufacturing industry: The Group of Ten.



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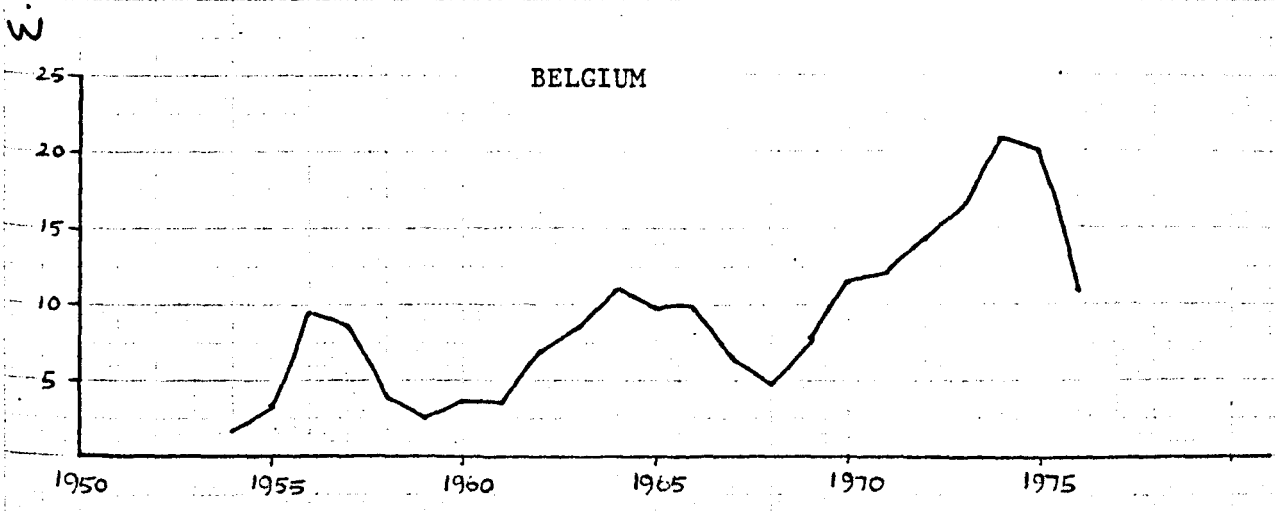
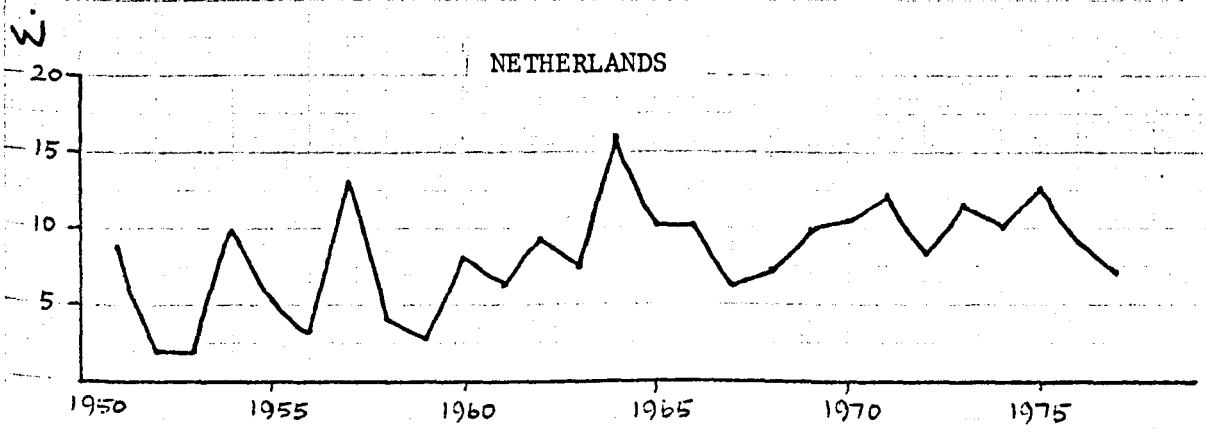




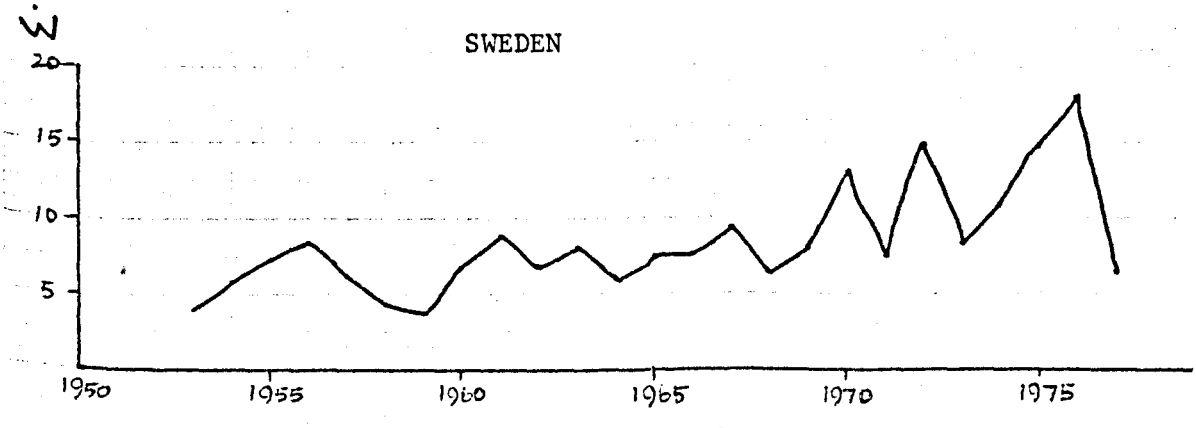


Figure I.2 cont.

strikes are positive functions of the expected rate of inflation, is also consistent with a primarily reactive role for unions, with strikes occurring as the consequence of the emergence of unanticipated inflation, rather than as a causal factor in wage inflation.

The resolution of these conflicting propositions in an international context as a means of explaining the events depicted in Figures 1.1 and 1.2 involves the detailed examination of the determinants of both strike activity and wage inflation across a variety of institutionally diverse industrial relations systems. It is this task which the present thesis sets out to accomplish.

As a convenient starting point Chapter 2 contains a critical analysis of the various economic models of cyclical strike activity that have been applied to explain fluctuations in strike frequency in the United States (Ashenfelter and Johnson 1969), the United Kingdom (Pencavel 1970; Hunter 1973; Shorey 1977), and Canada (Smith 1972). The underlying assumption of these models is that the decision to strike can be viewed as a primarily economic one, made by bargaining agents operating at plant level: an assumption, that is, of decentralised business unionism. Despite differences in the precise theoretical underpinnings of these models, and ambiguities over the precise nature of the behavioural relationships involved, their general thrust is that strikes are broadly responsive to the business cycle, and in particular to such individual components as the state of the labour market, changes in real wages (as well as their separate money wage and price components), and the level or share of profits.

In Chapter 3 this rather narrow focus is widened both

conceptually and geographically as attention is directed towards a critique of international comparative explanations of fluctuations in strike activity. On a conceptual level detailed consideration is given to an evaluation of the theoretical and empirical validity of strike models which emphasise the significance of political factors, either as a supplement to an economic explanation of strike fluctuations (Hibbs 1976), or, combined with organisational factors, as an empirically or theoretically superior alternative explanation (Shorter and Tilly 1974; Snyder 1974, 1975 and 1977). In terms of geographical scope, the analysis is broadened to encompass the process of strike determination in countries whose industrial relations systems are not confined to the predominantly North American pattern of decentralised business unionism. Thus attention is also given to countries in which trade unions espouse more political objectives, operate under centralised bargaining arrangements, and where the relationship between organised labour and the state is based upon either alienation (France, Italy and Japan), or integration (Sweden, Belgium and Germany), rather than institutional isolation as in the United States and Canada.

In Chapter 4, the focus is again broadened, this time to encompass the international experience of wage inflation. Through a critical theoretical and empirical evaluation of rival historical accounts of recent international trends in strikes and wage inflation, the Chapter seeks to make explicit contrasting views on the causal links between these two variables. Two such accounts are singled out for particular attention. The first, termed the 'international monetarist' explanation (Johnson 1972; Parkin 1972; Laidler and Nobay 1974; Zis 1975), argues that the international escalations in inflation occurring in the late 1960's and early 1970's were primarily an excess demand phenomenon, deriving from

escalations occurring in world money supply in the late 1960s. It is further argued that the strike 'explosions' depicted in Figure 1.1 must be seen as deriving from the emergence of unanticipated inflation. While not denying the importance of world money supply, the second account, attributed to the work of Soskice (1978), places much greater emphasis on cost push forces as the key determinants of wage inflation in the late 1960 s and early 1970 s. In particular, this analysis puts considerable stress on the role of common institutional responses by governments, particularly in the form of incomes policies, as a major factor in accounting for both strike and wage explosions. In the context of strikes, the key determining influences are seen as a variety of economic 'frustration factors', including increased employer pressure aimed at restoring plant level prerogatives during periods of labour market slack, moderated real wage growth due to increasing world prices in the face of increasing corporate profits, and finally the operation of some form of income or wage restraint policy. Thus, despite their contrasting perspectives, one conclusion that emerges from both analyses is that recent international escalations in strikes have been a primarily economic phenomenon, derived from broadly similar behavioural responses by trade unions and their members across institutionally diverse industrial relations systems.

Against this background, Chapter 5 develops and operationalizes a comparative model of strike activity which, while firmly based upon the pursuit of economic concerns, makes more concessions to reality than is usual by allowing for symmetrical responses to changing economic conditions by employers and unions; and also by allowing for the likely effects of bargaining at levels above that of the individual plant. In addition, in line with a number of previous economic models, allowance is made for the existence of three parties to negotiation: namely, management,

union leadership, and union rank and file. This assumption is, however, relaxed in Chapter 6 as account is taken of the intervention of government as a fourth partner to bargaining, acting through the imposition or encouragement of some form of incomes policy. Chapter 6 also provides a review of the diverse forms that such policies have taken among the member nations of the Group of Ten, and seeks to account for their emergence by reference to the dynamics of the prevailing industrial relations structure, and the need on the part of governments to achieve certain macroeconomic policy targets. The latter analysis, in turn, provides the starting point for the model of wage determination under incomes policy which is also presented in Chapter 6.

The results obtained from estimating the strike and wage equations developed in Chapters 5 and 6 are analysed in detail on a country by country basis in Chapter 7. Chapter 8 then draws the various strands of the analysis together, and by way of conclusion, summarises and outlines the implications that may be derived from the empirical work. Finally, details of the data sources and the correlation matrices derived during the estimations of Chapter 7 are presented in Appendices 1 and 2.

Footnotes to Chapter 1

1. The Group of Ten is comprised of the following countries: Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, the United Kingdom and the United States.

2. Strike frequency figures are not published for the Federal Republic of Germany, therefore strike volume (working days lost) figures are substituted both in Figure 1.1 and in subsequent analyses.

Chapter 2

Single Country Studies of Strike Activity

The notion that strike activity is broadly responsive to changes in the level of economic activity has a venerable history, dating as far back as 1868 and the early contribution of Ward (1868). Since that time, numerous studies have addressed the issue with varying degrees of theoretical and empirical rigour. These have ranged from the early empirical studies of Weyforth (1919), Hansen (1921), Griffin (1939), Yoder (1940), Gomburg (1944), Jurkat and Jurkat (1949), Knowles (1952), Rees (1952, 1954), and Levitt (1953); to the more recent contributions of Weintraub (1966) and O'Brien (1965). However, one of the most significant breakthroughs in the analysis of strikes undoubtedly came with the application of multivariate econometric techniques. This opened up a whole new vista of possibilities, freeing empirical work on strikes from its previous reliance on the use of individual business cycle components such as money national income (Gomburg), wholesale prices (Hansen), and components of industrial production (Weyforth); or the rather clumsy tool of business reference cycles[1] (Rees), and facilitating a much more precise form of model building and quantification.

The first, and in many ways still the most important study of this kind is that of Ashenfelter and Johnson (1969). Their work unleashed a flurry of activity in the analysis of strikes, particularly in Britain[2], and several features of their theoretical and operational specfications have been adopted in subsequent analyses. For this reason their work represents an essential starting point for any serious analysis of the economics of strike activity.

I. The Ashenfelter and Johnson Model

In addition to its pathbreaking use of econometric estimating techniques, the work of Ashenfelter and Johnson represents the first attempt to incorporate the analysis of strikes into a formal wage bargaining model with the aim of testing its predictions empirically. In developing this model, Ashenfelter and Johnson initially postulate three parties to wage negotiations at the level of the individual bargaining unit: namely, management, union leadership, and union rank and file. Following Ross (1948), the leadership is viewed as having objectives that are distinct from those of its members - including the survival and growth of the union, as well as the maintenance of its own political position - the achievement of which is largely dependent upon its ability to satisfy rank and file wage expectations. It is further assumed that under some circumstances these expectations will be in excess of what management will agree to. Knowing this, and in order to safeguard their authority, the union leadership is assumed to call a strike, the primary purpose of which is to bring about a downward revision in the minimum acceptable wage increase demanded by the rank and file. The strike then continues until a point is reached at which negotiations with management can be successfully concluded.

Basically, therefore, the strike is seen by Ashenfelter and Johnson as a mechanism for bringing rank and file expectations into line with the firm's ability to pay - a mechanism which union leaders, "feel impelled to utilize to solve their own political problems and facilitate the survival and growth of the organizations they lead" (Ross and Irwin, 1951). By making certain additional assumptions about the determinants of rank and file expectations and management's ability to pay, Ashenfelter and Johnson arrive at a model which links the probability of a strike to a series of observable economic variables as follows:

$$S_t = a_0 + a_1 \sum_{i=0}^{m} b_i \Delta R_{t-i} + a_2 U_t$$

$$+ a_3 D_{t-1} + a_4 T + E_t$$

where S_t is the probability of a strike occuring in period t, $\sum_{i=0}^{m} b_i \Delta R_{t-i}$ is a lagged moving average of real wage changes, U_t is the unemployment rate, D_{t-1} is a lagged profit variable, T is a trend term and E_t a disturbance term.

In this formulation the probability of a strike is assumed to be negatively related both to past changes in real wages and to the unemployment rate. With regard to the latter variable, inclusion is viewed as a means of testing the proposition that strike activity is sensitive to labour market conditions. The relationship is considered an inverse one for three reasons. First, when unemployment is low, workers will be faced with improved job possibilities, raising their opportunity costs and hence their expectations in their current job. Second, leadership will be less constrained by the possible employment effects of a large wage demand and will also have larger strike funds. Finally, low unemployment will increase the availability of part-time jobs and hence potential in-strike sources of income, thereby lowering strike costs.

With regard to the real wage variable, specification as a lagged moving average provides a theoretical test of the existence of an expectations-achievement gap. Thus, large increases in the recent past are assumed to be associated with broadly realized expectations and hence fewer strikes.

No <u>a priori</u> restrictions are placed upon the lagged profits variable, since while high profits are assumed to lead to increased union

aggressiveness, they are also assumed to enhance ability to pay on the part of employers. Finally, the trend term is included to control for secular movements in strike activity. This is assumed to have a negative sign, reflecting the increased effectiveness of methods of resolving a variety of non-pecuniary issues - in short, the progressive institutionalization of industrial conflict.

Before the model can be tested empirically, a proxy must be found for the dependent variable, since strike probabilities are unobservable. To solve this problem Ashenfelter and Johnson assume that strike probability may be reasonably approximated by the ratio of the number of strikes in a given period to the number of contract expirations. In the absence of reliable data on contract expirations, however, the final estimating equation is specified in terms of frequency, while seasonal dummy variables are included on the right-hand side to pick up the seasonal pattern in expirations.

The resulting estimating equation is fitted to U.S. quarterly data for the period 1952-1967. Their results indicate that, except for the profits variable, all partial coefficients are highly significant, stable over sub-periods, and of the expected sign. Moreover, the equation is capable of 'explaining' over 90 percent of the variance in aggregate strike frequency. These results are summarized in Table 2.1 on page 2.10.

Despite its empirical success, several important criticisms may be made of Ashenfelter and Johnson's analysis. First, it places the whole onus of adjustment firmly on union rank and file expectations, while no parallel adjustment by management is envisaged. Thus, union leaders are assumed to accept the management's offer as a dictum, so that strikes become lost causes for the rank and file by definition. Second, the model is heavily reliant on the existence of perfect knowledge on the part of both management and union leaders - an omniscience that is conveniently not extended to the union rank

and file. Indeed, it is this very fact which rationalizes the latter's pursuit of a strike that all other parties to negotiations already know to be futile. In short, Ashenfelter and Johnson have constructed a bargaining model that effectively abstracts from many of the key aspects of real world collective bargaining situations. They have chosen to ignore the fact that bargaining outcomes are jointly determined within an economic environment that is characterized by a significant degree of uncertainty, and in which the information available to both sides is far from perfect.

In addition to the unsatisfactory nature of the behavioural assumptions underlying the Ashenfelter and Johnson model, doubts must also be expressed over certain aspects of its empirical specification. First, there is the question of the a priori restrictions placed on several of the independent variables. Thus, while Ashenfelter and Johnson admit to the ambiguity of the effects of profits on strike frequency, such problems of interpretation are not confined to this variable alone. First, consider the inverse relationship postulated between unemployment and strikes. Though all of the arguments advanced are plausible, they are certainly not the only ones that could reasonably be advanced. It could, for example, also be argued that feelings of worker discontent are likely to be greatest during recessions, particularly if employers seek to exploit looser labour markets to regain concessions made during booms. Alternatively, unions may call strikes as a form of protest over high unemployment, directing attention as much against the government (in the hope of promoting expansionary policies), as against individual employers. In short, unemployment may actually be a significant cause of strikes, rather than simply a factor affecting expectations or relative bargaining power, and hence merely their timing.[3]

Further, with respect to real wage changes, Ashenfelter and Johnson suggest that rapid increases in the recent past will reduce current wage expectations by narrowing the expectations-achievement gap. Equally plausible, however, is the argument that this will simply lead workers to expect increases that are at least as large in the future. Indeed,just such an argument has been used by Smith (1976) to explain why union leaders might be unwilling to fully exploit their short-run bargaining advantage during wage negotiations. Alternatively, it could be argued that in terms of the formation of rank and file wage expectations, recent gains by other groups within the appropriate 'orbits of coercive comparison' (Ross 1948), or 'wage contours' (Dunlop 1950), will be just as important as workers' own past gains. Moreover, to the extent that they pick up this effect, lagged aggregate real wage changes are as likely to be positively related to strikes as they are negatively related. Finally, it could be argued that workers' wage concerns do not so much revolve around changes in gross real wages as around net (i.e. after tax) take home pay (Jackson et al. 1972). Indeed, this is particularly likely to be significant in an inflationary environment where workers face high marginal tax rates, and social security thresholds denominated in nominal rather than real income.

Next, there is the inclusion of dummy variables to represent variations in contract expirations. In practice these are likely to pick up considerably more than expirations, since it is well known that strikes also follow a pronounced seasonal pattern, reflecting in part variations in the costs of striking at different times of year (Shorey 1974).

Finally, there is the question of the use of aggregate strike frequency as the dependent variable. Ashenfelter and Johnson's specification is firmly based upon a model of wage bargaining, yet as they themselves admit, not all

stoppages can be traced to wage issues. Indeed, two categories other than matters of pay are referred to in their discussion: namely, non-wage items such as fringe benefits; and institutional reasons such as union recognition and grievances. In order to handle these, the first category is assumed to have a money equivalent so that it can be 'imputed to the contract wage'; while the second, which lies outside the scope of their theory, is assumed to be absorbed into the constant term. However, it has been estimated that over the post-war period only about half of the strikes occurring in the United States in any given year have been over wage related issues (including fringe benefits, incentive rates, job classifictions and paid vacations) (Shalev 1980). Thus, even if their model is consistent with aggregate variations in these strikes - and its high overall explanatory power would seem to suggest that this is in fact the case - Ashenfelter and Johnson's hypotheses provide no specific clues as to why this might be so.

It is clear from the foregoing discussion that Ashenfelter and Johnson's analysis has many serious weaknesses. In making an overall assessment, however, it must be emphasized that in spite of its grossly oversimplified view of the collective bargaining process, the Ashenfelter and Johnson model does provide both valuable insights into the economics of the strike decision, and a variety of testable predictions concerning the probability of a strike's occurrence. This fact, together with its highly satisfactory empirical performance with U.S. data, has undoubtedly contributed to the widespread application of the basic estimation equation to explaining strikes in a number of other countries. One such study is that of Pencavel (1970) using United Kingdom data.

The Analysis of Pencavel

The importance of Pencavel's work lies in the fact that it was the first of many subsequent attempts[4] to apply Ashenfelter and Johnson's model to a different institutional context.[5] However, while the specification employed is virtually identical to that of Ashenfelter and Johnson, the precise interpretation given to several of the variables is modified to take account of the different institutional environment prevailing in the United Kingdom. For example, the absence of legally binding collective agreements in Britain, and hence the absence of enforceable no-strike clauses, means that workers are not constrained to the same degree to strike only during those periods when agreements expire.[6] There is, however, a pronounced seasonal pattern in the U.K. strike activity (Knowles 1952), and quarterly dummy variables are included in Pencavel's equation to pick up this phenomenon rather than contract expirations.

Certain other institutional modifications introduced into the analysis, including a consideration of the role of shop stewards in the bargaining process, have only cosmetic significance. For example, Pencavel suggests that while shop stewards generally exert a moderating influence over their members, they will nevertheless seek to safeguard both their own position, and the solidarity of the union, by calling a (usually unofficial) strike, 'rather than allowing the initiative to slip into the hands of militants'. Thus, in Pencaval's reinterpretation, the shop steward movement simply takes on the role of Ashenfelter and Johnson's union leadership, leaving the behavioural assumptions of the latter analysis unchanged.

The actual equation fitted by Pencavel is as follows:

$$S_t = a^0 + a^1 U_t + a^2 \sum_{i=0}^{m} b_i R_{t-i} + a^3 D_{t-1}$$

$$+ \sum_{i=2}^{4} a_{4_i} N_{it} + a_5 T_t + a_6 J_t + a_7 L_t + E_t$$

where N_{it} are the seasonal variables, and the new variables J and L represent dummies for the effects of incomes policy, and a Labour Government, respectively. It is expected that:

$$a_1;\ a_2\ a_6;\ \text{and}\ a_7 < 0$$

$$a_{4\cdot 1};\ a_{4\cdot 2} > 0$$

$$a_3 \lessgtr 0$$

In fitting this estimating equation to U.K. quarterly strike frequency data outside mining[7] for the period 1950-1967, Pencavel confirms its empirical credentials, with all the variables except the third quarter seasonal dummy variable significant and correctly signed. In addition, 87 percent of the variance in aggregate strike frequency is accounted for. These findings are summarized in Table 2.1 on page 2.10.

Pencavel's findings for the U.K. reveal one interesting contrast with those of Ashenfelter and Johnson for the United States. Pencavel obtains a significant positive trend term with U.K. strike frequency, whereas the U.S. apparently experienced the opposite pattern. Pencavel seeks to attribute this result to the fact that in the United Kingdom, the rising expectations of workers have not been accompanied by institutional developments on the industrial relations front which are capable of handling employee grievances speedily and effectively. In short, that "Britain's system of industrial relations has been suffering from the rigidity of an old established structure inflexible in relation to a change in the relative bargaining power of the participants" (p. 247). This argument clearly bears a strong family resemblance to the Donovan Commission's (1968) notion of the 'inadequacy of institutions', in which respect it contrasts markedly with Ashenfelter and Johnson's assumption of the progressive institutionalization of industrial conflict in the United States.

Table 2.1
Quarterly Strike Frequency Studies, Three Countries, The Post-War Period.

Author	Country	Period	U_t	$\sum_{i=1}^{6} \Delta R_{t-i}$	D_{t-1}	N_2	N_3	N_4	T	R^2	D-W
A-J	USA	1952-67	-**	-**	+	+**	+**	+**	-**	0.94	1.44
Pencavel	UK	1950-67	-**	-**	+**	+**	+**	+	+**	0.87	1.36
Smith	Canada	1953-68	-**	-**	-**	+**	+**	+**	+**	0.82	1.66

Source: Ashenfelter and Johnson (1969); Pencavel (1970); Smith (1972)

Notes: R^2 is the unadjusted correlation coefficient; D-W the Durbin-Watson statistic.

** indicates a coefficient is significant at the 1% level, while +/- indicates its sign.

The independent variables are defined as follows:
U_t = unemployment in '000's;

$\sum_{i=1}^{6} \Delta R_{t-i}$ = six quarter lagged moving average of real wage changes, estimated using an Almon (1965) lag technique;

D_{t-1} = lagged profits variable;

N_2, N_3, N_4 = seasonal dummy variables representing the second, third and fourth quarters of the year.

T = trend term

An important conclusion that would seem to emerge from a comparison of these findings is that, despite obvious differences in labour relations institutions, as well as in the secular performance of these institutions between the two countries, they have apparently not substantially affected the overall performance of the Ashenfelter and Johnson model, at least over the period under consideration. Moreover, this conclusion would appear to gain further credence in the light of the findings of both authors with respect to the structural stability of their fitted equations over time, despite the occurrence of institutional developments of the type adduced to explain the contrasting trend terms. As Table 2.1 illustrates, on the basis of the findings reported by Smith (1972), in an application of the Ashenfelter and Johnson model to Canadian quarterly strike data, this conclusion can also be generalized to include the post-war experience of Canada.

These findings clearly raise the question of whether the model can be applied equally successfully to countries with industrial relations systems that are even more institutionally diverse than those of the United Kingdom, the United States and Canada. This issue is addressed in some detail in Chapter 3; however before moving on, it is important to emphasize that two more recent studies of British strikes have reported results which raise some doubt about the continued stability of the Ashenfelter-Johnson model. These are the studies of Hunter (1973) and Shorey (1974).

The Analysis of Hunter

The starting point for Hunter's analysis is an attempt to fit the basic Ashenfelter-Johnson model to a later period than that undertaken by Pencavel - namely the period 1968-1972. The result is the serious underprediction of the observed level of strike activity, a problem which leads Hunter to suggest a

number of modifications to the basic model. These modifications center around the possible inconsistency of the unemployment rate as an indicator of the state of the labour market, the interpretation of the trend term, and the inclusion of a variety of additional explanatory variables.

In particular, Hunter substitutes the unfilled vacancy rate (V_t) for unemployment as an index of labour market conditions; replaces the trend term with the female participation rate (A_t), as a proxy for the availability of alternative sources of household income for strikers (and hence a major determinant of strike costs); and adds the lagged rate of change of unionization, $(\dot{M}_{t-1})$[8], as a measure of trade union militancy. Finally, Hunter also adds a series of dummy variables proxying the effects of incomes policy in both its 'hard' (IPH) and 'soft' (IPS) phases, and the impact of Labour Governments (LG).

Estimating this modified model using annual[9] non-mining strike frequency data for the period 1950-1971, Hunter obtains a significant negative coefficient on the real wage change variable, thereby confirming previous findings; and obtains significant positive coefficients on both the female participation rate, and the lagged rate of change of unionization. He finds no significant relationship between strike frequency and either profits, or more disturbingly, the state of the labour market as proxied by the new variable unfilled vacancies. With regard to his dummy variables, contrary to expectations, neither the presence of a Labour Government, nor the operation of either hard or soft phases of income policy, appeared to have any significant depressive effect on strikes. Indeed, in the case of the hard phase the estimated coefficient was actually positive.[10]

By omitting the non-significant variables from his original specification, Hunter transforms his strike frequency model into a new form as follows:

$$S_t = a^0 + a^1 \sum_{i=0}^{m} b_i \Delta R_{t-i} + a^2 A_t + a^3 \dot{M}_{t-1} + E_t$$

where all variables are as previously defined, and $a_1 < 0$; $a_2 > 0$ and $a_3 > 0$.

While this model performs marginally better than the original Ashenfelter-Johnson formulation in the context of more recent data, it is still prone to serious underprediction. Moreover, there are several doubts about the validity of certain aspects of its specification. Of particular concern is the theoretical justification for the inclusion of the rate of change of union density as an index of worker militancy. This variable, which Hunter derives from Hines (1964) on the suggestion of Pencavel (1970), has been subject to extensive criticism in the context of wage inflation studies (Purdy and Zis 1973). In addition, on an empirical level, it is well established that the rate of change of union density is itself partly a function of the rates of change of wages and prices, and the level and/or rate of change of unemployment (Bain and ElSheikh 1976). Consequently, inclusion of unionization as an additional explanatory variable in the strike equation is likely to introduce a high degree of collinearity, a fact which makes the precise interpretation of Hunter's findings problematical. Given this, the model cannot be seen as in any sense displacing that of Ashenfelter and Johnson in the British context. Nevertheless, Hunter's reformulation does draw attention to the possible role of additional explanatory variables as determinants of strike fluctuations, as well as introducing an empirical question mark over the relevance of the Ashenfelter-Johnson model to more recent British strike experience.

The Shorey Model

The importance of Shorey's analysis lies, in part, in his attempt to derive a formal strike model from premises that are considerably more realistic than those of Ashenfelter and Johnson. While his initial frame of reference is still that of plant level wage negotiation by an individual bargaining unit, his analysis seeks to explicitly acknowledge the existence of imperfect knowledge and economic uncertainty. Consequently, both short-run profit and wage-bill maximization are rejected as useful or appropriate decision criteria in favour of an analysis based on the pursuit on longer-run objectives. This is of particular importance in the context of strike costs which, insofar as they depend upon probable strike length, are considered to be largely unknown quantities during collective bargaining.[11]

Against this background, Shorey postulates a model firmly rooted in the conventional economic analysis of bilateral monopoly, in which the probability of a strike is related to the size of the gap between the union's final demand and management's final offer, with each side's willingness to move toward an ultimate settlement assumed to depend upon its (uncertain) estimate of its respective strike costs. Strike probability is then related to a series of observable economic variables via the specification of the likely determinants of the union demand and employer offer.

In particular, the management side is assumed to respond positively to the settlements recently granted by other employers ($\dot{W}_{t-j}$), the rate of change of productive activity within the bargaining unit ($\dot{K}_t$)[12], and recent changes in its product prices ($\dot{P}^{w}_{t-1}$); while union demands are assumed to depend positively upon the settlements recently achieved by other workers ($\dot{W}_{t-j}$), the level of local productive activity (A_t)[13], and recent changes in consumer prices ($\dot{P}^{c}_{t-j}$). Strike costs for the employer are then assumed

to depend positively on the level of profits (D_t); while for the union they are assumed to depend positively upon the size of the total wage bill (WB_t)[14], the level of unemployment (U_t), and variously on the time of year. Finally, the occurrence of a strike is also assumed to depend positively on the union's anticipation of success in calling a strike, which is proxied by strike frequency in the previous period (SS_{t-1}).[15]

Omitting seasonal variables, these arguments may be combined to produce a comprehensive estimating equation in strike frequency[16] as follows:

$$S_t = a0 + a1\,\dot{W}_{t-j} + a2\,\dot{P}^{c}_{t-j} + a3\,A_t + a4\,\dot{K}_t + a5\,U_t + a6\,D_t + a7\,WB_t + a8\,SS_{t-1} + a9\,T + E_t$$

where the additional variables are the trend term, T, and a disturbance term, E; and with $a3, a8 > 0$ and $a4, a5, a6, a7 < 0$. With regard to the wage and price[17] terms, insofar as these affect both management offers and union demands in the same direction, their impact is considered ambiguous. However, Shorey argues on a priori grounds that $\dot{P}^{c}_{t-j}$ will be positively related, and $\dot{W}_{t-j}$ negatively related to aggregate strike frequency.

Estimation of this model using quarterly data on U.K. strike frequency outside mining over the period from first quarter 1959 to first quarter 1967 indicates a significant positive relationship between strikes and the rate of change of consumer prices, stoppages in the previous period, the trend term, and the first quarter seasonal dummy; while a significant negative relationship is established with the rate of change on money wages. No significant relationship is found with either real profits, the rate of change of productivity, the aggregate wage bill, unemployment, or additional dummy variables included to proxy incomes policy and the effects of a labour government.

Omitting non-significant variables effectively reduces Shorey's model to the following form:

$$S_t = a_0 + a_1 \dot{W}_{t-j} + a_2 \dot{P}^c_{t-j} + a_3 A_t + a_4 SS_{t-1} + a_5 T + E_t$$

Taking the index of productive activity (A_t) as a proximate indicator of excess demand, the only substantive difference between this model and that of Ashenfelter and Johnson is the inclusion of a lagged dependent variable - a somewhat dubious distinction given the estimating problems it introduces.[18] Moreover, application of this slimmed down model to predict U.K. stoppage frequency over the period 1967-1972 also produces serious underprediction of the observed values.

Shorey seeks to explain this phenomenon via recourse to a series of ad hoc arguments based upon the effects of structural and institutional changes - including incomes policy, employer resistance due to falling profits; and stagnant real wages - but goes on to argue that there is nothing to suggest that post-1967 behaviour is really significantly different from previous experience. Given the presence of all these variables in his estimating equation, however, this conclusion is hard to sustain. What Shorey's findings do provide, in fact, is further confirmation of the unsatisfactory performance of a conventional economic model in explaining recent British strike experience.

Conclusions

Despite differences in their precise theoretical underpinnings, all of the approaches surveyed in this chapter demonstrate a number of major similarities. First, all are essentially micro-economic in orientation. That is, they are all explicitly derived from a basic conception of the strike as the result of a breakdown in plant level negotiations over pay. Despite this micro orientation, however, all are nevertheless ultimately tested at the macro level.[19]

Second, all the studies employ a strike frequency measure as their dependent variable, ignoring other measures such as working days lost (or strike volume), average strike duration and average strike size. In part, this reflects the fact that the bargaining models on which these studies are based are all formulated in terms of strike probability which, though not observable, can be readily translated into strike frequency. However, this also reflects recognition of the fact that strike frequency is much more sensitive to economic fluctuations than other measures (Skeels 1971, Walsh 1975).

A third similarity derives from the fact that several of the explanatory variables are common to all studies. Thus, labour market conditions - proxied by unemployment or vacancies - the rates of change of wages and prices, and profits are included in all specifications, as are dummy variables for such factors as incomes policy and changes in government. The great divide comes in terms of the empirical significance of these variables. That is, while all the studies surveyed find that inflation has had a significant positive influence, and wages a significant negative influence on strikes regardless of institutional context, the later studies of Shorey and Hunter suggest little influence for either profits or unemployment in the recent British context, thus contradicting the earlier findings of Pencavel.

An additional point that emerges fairly clearly is that none of the equations surveyed performs well in the British context when extended beyond the period for which it was originally estimated. In particular, none of the models seems capable of handling the explosion in strike frequency that occurred in Britain in 1970. On an ad hoc basis it has been argued that an underlying change may have taken place in the structure of the relationship between strike activity and economic variables from the late 1960s onward,[20] and there would seem to be some evidence to support this contention. The period was

indeed characterized by a degree of economic turmoil unparalleled since the War, with accelerating rates of domestic and world inflation, growing unemployment, a decline in the rate of profit, and a much greater degree of government intervention via successive incomes policies all contributing to a climate of greater uncertainty in collective bargaining.

It is important to emphasize that these problems were not confined to the United Kingdom. Most Western nations found themselves subject to similar pressures, and as the graphs in Chapter 1 clearly show, all experienced significant escalations in strike activity at about the same time. This suggests, at least circumstantially, that the search for the factors contributing to recent strike experiences might usefully be pursued at an international level. Accordingly, Chapter 3 shifts the focus away from single country studies, and toward more broadly based international comparative explanations of strike experience. Moreover, in addition to widening the geographical focus, attention is directed toward a broader conceptual framework than that provided by purely economic models.

Footnotes to Chapter 2

1. See A.F. Burns and W.C. Mitchell, Measuring Business Cycles, New York, National Bureau of Economic Research, 1946.

2. In addition to the contributions reviewed in this Chapter, studies have been undertaken in Britain by R. Bean and D.A. Peel, 'A Quantitative Analysis of Wage Strikes in Four U.K. Industries 1962-1970', Journal of Economic Studies, 1974, pp. 88-97; D. Sapsford, 'A Time Series Analysis of U.K. Industrial Disputes', Industrial Relations, vol. 14, No. 2, 1975, pp. 242-249; and K.G. Knight, 'Strikes and Wage Inflation in British Manufacturing Industry, 1950-1968', Bulletin of the Oxford University Institute of Economics and Statistics, Vol. 34, 1972, pp. 281-94.

3. This argument is advanced by A. Rees, Industrial Conflict and Business Fluctuations', Journal of Political Economy, Vol. 60, 1952, pp. 371-82.

4. Despite differences in their theoretical underpinnings many subsequent models have employed operational specifications broadly analogous to Ashenfelter and Johnson. These include Hunter (1973) and Shorey (1977). The contribution of both authors is reviewed in greater detail below.

5. In the Canadian context reference should be made to Smith (1972) and Walsh (1975); while in a more broadly comparative context to the work of Snyder (1974, 1975 and 1977) and Hibbs (1976).

6. This is not to imply that strikes do not occur during the term of collective agreements in the U.S., but simply that such strikes as do occur are illegal.

7. In view of the significant decline in the frequency of mining stoppages occuring over the period (associated with the shift to centralized bargaining), mining stoppages are conventionally omitted to avoid biasing the overall trend.

8. The use of this variable is suggested by Pencavel (1970) following Hines (1964).

9. Annual data is used in place of quarterly data given the unavailability of either M_{t-1} or A_t on a quarterly basis.

10. Hunter justifies this result on the grounds that harder phases of incomes policy, representing greater government intrusion in collective bargaining, have been associated with increased union hostility. This issue is discussed in greater detail in Chapters 6 and 7.

11. In practice this may not be a very realistic assumption, particularly in the context of large firms who, according to the survey evidence of Daniel (1977), do make systematic cost/benefit calculations in relation to strikes.

12. This variable is included as an index of ability to pay.

13. This variable acts as a local labour market proxy, such that when local productive activity is high, the demand for labour and hence worker's wage demands (and bargaining power) will also be high.

14. The wage bill provides a potential index of the opportunity costs of striking for workers.

15. The lagged strike variable is also interpreted as proxying the effects of external militancy on workers, a factor assumed to further reinforce the hypothesized positive relationship with current strike probability. In practice, however, this result is far from obvious. External militancy will also influence employers, and may make them more willing to concede without a strike. Equally, previous strikes within the bargaining unit may have had the effect of reducing workers' financial capacity to pursue a strike in support of current negotiations, implying an inverse relationship between SS_{t-1} and current strike probability.

16. Strike probability is transformed into strike frequency by assuming that strike probability for each bargaining unit is approximated by the ratio of the total number of strikes to the total number of bargaining units. Then, if the number of bargaining units is more or less constant through time, strike probability will vary with the number of strikes.

17. In the operational specification of the model the distinction between product and consumer prices is dropped.

18. For the problems associated with the inclusion of a lagged independent variable in the estimating equation see Pindyck and Rubinfeld (1976).

19. It is interesting to note that Pencavel (1970) also estimates the Ashenfelter and Johnson model at the industry level, but fails to obtain satisfactory results.

20. Similar problems afflicted the Phillips relation around this time.

Chapter 3

Comparative Studies of Strike Activity

Compared with the effort that has been expended on time series analyses of strike activity at the national level, the area of international comparative research has been the objective of profound neglect. In practice, most studies adopting an international perspective have been much more concerned with the explanation of secular rather than cyclical developments.[1] Fortunately there are exceptions, and recent years have witnessed several important contributions by both economists and sociologists. Indeed, the major empirical and theoretical challenge to the hegemony of orthodox economic explanations of short-run strike fluctuations has come in the area of international comparative research. The main purpose of this chapter is to critically assess three of these contributions: namely, those of Hibbs (1976), Shorter and Tilly (1974), and Snyder (1974, 1975 and 1977).

The Analysis of Hibbs

Though not the first international comparative study of strikes, the work of Hibbs (1976) nevertheless provides a useful starting point, partly because it forms a natural bridge with the economic analyses considered in Chapter 2, and also because it is in many respects the most ambitious study to date.

The primary aim of Hibbs' analysis is the development and testing of a statistical model capable of explaining short-run fluctuations in post-war aggregate strike activity across a ten-country sample. The countries in question are Belgium, Canada, France, Italy, Japan, the Netherlands, Norway, Sweden, the United Kingdom and the United States.

From the outset, Hibbs' approach contrasts in several important respects with those of previous authors. First, he chooses strike volume (i.e. working days lost) rather than strike frequency as the dependent variable. One advantage of this substitution is that strike volume is generally assumed to be less prone to measurement error. For example, as Clegg (1972) has argued in the British context, while strike frequency is prone to distortion because many small strikes are never reported, the fact that these strikes make only a small contribution to total working days lost means that this variable is likely to present a rather more accurate and comprehensive picture.

This view is shared by Vanderkamp (1970), who employs working days lost as the relevant dependent variable in his analysis of Canadian strike data. According to Vanderkamp, this composite measure most clearly approximates the economic costs which constitute the output foregone as a result of strikes, not least because it takes into account the relevant dimensions of strike activity - their length and size as well as their frequency. This view is also clearly shared by Hibbs, who justifies his use of working days lost on the grounds that it more nearly approximates the net damage caused by strikes.

Such reasoning is open to criticism on the grounds that strike volume makes no allowance for time lost by workers indirectly involved at plants other than the one in dispute. Indeed, such are the vagaries of international measurement that some countries - including Belgium, Canada, Italy and Japan - do not even include workers indirectly involved at the plant actually in dispute (Fisher 1973). This clearly introduces important questions (both of definition and of measurement variation across countries) which Hibbs does not

address. This is a serious omission, since the second unique feature of Hibbs' approach, namely his use of pooled time-series and cross-section data[2], would seem to raise some questions about the validity of combining strike figures measured on different bases in different countries.

In further contrast with previous studies, in formulating his statistical model, Hibbs explicitly rejects the narrow parochialism of purely economic bargaining models in favour of a broader politico-economic approach. Thus he identifies two broad categories of factors that are likely to affect inter-temporal and international variations in strike activity. The first category reflects the conventional economic wisdom by including such variables as movements in real wages, the degree of excess demand for labour, and changes in the profits ratio. However, the second category extends the analysis by introducing as additional variables the prevailing configuration of parties in the political arena - including the competitive position of labour-oriented parties on the non-communist left - and the extent of communist party influence.

Though not derived from a formal analysis of the bargaining process, Hibbs' specification of the economic components of his model bears a strong family resemblance to that of Ashenfelter and Johnson. Formally it is expressed as follows:

$$SV_t = b_0 + b_1 \sum_{i=1}^{m} d_i \, \Delta R_{t-i} + b_2 U_t + b_3 \Delta C_t + E_t$$

with $b_1, b_2 < 0$; $b_3 \gtrless 0$,

where SV_t is strike volume; $\sum_{i=1}^{m} d_t \, \Delta R_{t-i}$ is a polynomial-lag specification

representing the long-run expectations - achievement gap in real wages; U_t is the unemployment rate; and ΔC_t changes in the ratio of aggregate profits to total employee compensation, included as a proxy for changes in the relative shares of labour and capital in national income.

The interpretation given to these variables is analogous to that of Ashenfelter and Johnson. Specifically, large increases in real wages are associated with a low expectations-achievement gap, and hence lower strike activity. On the other hand, low unemployment is assumed to offer strategic advantages to an aggressive labour force, including good prospects for alternative employment, abundant temporary or part-time job opportunities to supplement in-strike income, and a reduced ability on the part of employers to replace potential strikers. All these factors are assumed to produce an inverse relationship between strike activity and unemployment. Finally, since profits are likely to promote both greater demands by labour, but also greater in-strike opportunity costs for employers, their effect on strike volume is considered indeterminate.

Apart from the use of strike volume in place of strike frequency as the dependent variable, the main difference between Hibbs' formulation and that of Ashenfelter and Johnson lies in the specification of the profits term as a rate of change rather than as a level. In addition, Hibbs also experiments with several alternative specifications of the real wage variable. As well as the Almon lag formulation[3] of the expectations-achievement gap, Hibbs also specifies two alternative formulations, one based upon extrapolative expectations,[4] the other on adaptive expectations plus a trend.[5]

Utilizing these alternative specifications, Hibbs estimates three different versions of the above model using pooled annual data from the ten countries over the 20-year period 1950-1969. In the fitted equations, all parameters except the intercept terms, which are allowed to take a unique value for each country, are assumed to be invariant both across time and between countries. By specifying the model in this form, Hibbs implicitly assumes that different institutional arrangements affect only the underlying levels of strike activity, but have no significant impact on the causes of fluctuations around these levels. In this sense, his work is clearly an extension of the findings of Ashenfelter and Johnson, Pencavel, and Smith.

Hibbs' best fitting equation turns out to be that containing the polynomial distributed lag specification originally used by Ashenfelter and Johnson. This equation, which accounts for 53 percent of the variance in strike volume,[6] indicates a significant inverse relationship between strikes and both real wage changes (in the form of an expectations-achievement gap) and unemployment; while the coefficient on the rate of change of profits variable appears insignificant. The precise details are reproduced in equation 1 of Table 3.1, on p. 3.7.

In considering these results, Hibbs emphasizes that all his fitted equations embody the assumption that strike activity responds to real as opposed to money wage changes. That is, that workers do not suffer from money illusion. In order to test this proposition, the real wage variable is divided into its money wage and price components. Re-estimation produces the expected negative coefficient on the money wage variable and positive coefficient on

the price change variable, however in the latter case it is insignificant. Nevertheless, Hibbs, somewhat surprisingly, still concludes that the two coefficients are statistically equivalent (see equation 2, Table 3.1).

The overall validity of these results is clearly heavily dependent upon Hibbs' basic assumption of parameter equivalence across countries - an assumption which a priori might seem somewhat implausible given both the diversity of national institutional arrangements and strike recording procedures encompassed by his sample. Hibbs does recognize this, and in an attempt to allow for the effects of institutional variation he singles out for consideration one important aspect of the institutional environment frequently associated with a low level of industrial conflict: namely, the degree of centralization of collective bargaining.[7]

Table 3.1
Significance of Estimated Regression Coefficients for Economic and Political Determinants of Strike Volume. Ten Industrial Countries, Belgium, Canada, France, Italy, Japan, Netherlands, Norway, Sweden, U.S., and U.K., 1950-1969. Pooled time-series, cross-section data.

Equation	U_t	ΔC_t	$\sum_{i=1}^{5} \Delta R_{t-i}$	$\sum_{i=1}^{5} \Delta W_{t-i}$	$\sum_{i=1}^{5} \Delta P_{t-i}$	LI_t	LG_t	CP_t	LI^*E_t	LG^*E_t	R^2
1	-**	+	-*								0.53
2	-**			-*	+						0.53
3	-**		-**			-	+	+**			0.58
4	-**		-**					+**	+	-	0.58
5	-**		-**					+**			0.58

Source: Hibbs (1976)

Economic Variables:

U_t = unemployment

ΔR = lagged real wage variable

ΔW = lagged money wage variable

ΔP = lagged price variable

* significant at 0.5% level

** significant at 0.1% level

Political Variables:

LI_t = Labour/Socialist Party Incentive Index

LG_t = Labour/Socialist Government dummy

E_t = Election year dummy

CP = Communist party variable

The precise definition of the political variables is discussed in the text.

In support of this selection, Hibbs relies heavily on the classic comparative study of Ross and Hartman (1960). However, it needs to be emphasized that in practice Ross and Hartman attributed observed declines in strike activity[8] - or in their famous phrase, 'the withering away of the strike' - to a variety of factors in addition to simply the degree of centralization of collective bargaining. These included employer policies, improved dispute settlement techniques, increased government activity in the economy and trade union programmes, as well as such secular movements as the

growth of white collar employment, steady improvements in living standards and a general decline in ideology.[9] More systematically, four key aspects of the prevailing industrial relations environment were singled out for particular attention. First, the organisational stability of the labour movement. Second, the extent of leadership conflict. Third, the status of labour management relations - by which was meant the degree of acceptance of both unions and collective bargaining by employers. And fourth, the existence or otherwise of state-imposed dispute settlement procedures.

In addition to these purely institutional factors, Ross and Hartman also pointed to the importance of certain aspects of the political context. Thus, the existence of worker based political parties, and more especially of leftist governments, was also seen as a major force in allowing the labour movement to "foresake the strike in favour of broad political endeavours" (Ross and Hartman p. 42).

Combining these elements, Ross and Hartman concluded that older, stable and unified union movements with a large measure of employer acceptance, centralized and consolidated collective bargaining, and effective working class political representation were conducive to a withering away of the strike. By contrast, where these contextual factors were absent, the strike remained, 'a technique of massive demonstration and protest rather than a phase in the collective bargaining process.'

The essential features of this argument and the countries to which it was considered to apply are summarized in Table 3.2. In interpreting this table, it is important to bear in mind that in applying the various aspects of the

Table 3.2

Strike Patterns and the Institutional Environment

The Classification of Ross and Hartman

COUNTRY	STRIKE MEASURE		ORGANIZATIONAL STABILITY		ORGANIZATIONAL UNITY		COLLECTIVE BARGAINING		LEFTIST INFLUENCE		ROLE OF STATE	
	Membership Involvement ratio[1]	Duration[2]	Age	Membership	Factions	Communist Influence	Employer Acceptance	Bargaining Structure	Party	Participation in Government	Regulation of Employment	Role in Collective Bargaining
Sweden	low	long	old	stable/ high	subdued	weak	widespread	Highly centralized	Yes	Common	Limited	Passive
Germany Netherlands UK	low	low/ moderate	old	stable/ high	subdued	weak	widespread	Highly centralized	Yes	Common	Limited	Active
USA Canada	Medium/ high	long	fairly young	fairly stable/ low	subdued	weak	widespread	decentralized	No	No	Limited	Mixed
Japan France Italy	High	low	young/ reorganized	unstable/ low	marked	strong	Uncommon	Limited consolidation	Not-Unified	No	Marked	Passive

Source: Eldridge (1968), p. 29

Notes: These classifications are to be viewed more as 'tendencies' than absolutes (Eldridge 1968).

[1] Total working days lost divided by the number of union members.

[2] Total working days lost divided by the number of strikes.

institutional and political context to an explanation of comparative strike patterns, Ross and Hartman went to some lengths to emphasize that their effects were not to be assessed independently, but only as a part of an appropriate overall configuration.[10] In singling out the degree of centralization of collective bargaining as the crucial distinguishing variable, therefore, Hibbs totally ignores the host of other factors that industrial relations writers in general[11] and Ross and Hartman in particular have specified as relevant in accounting for international differences in industrial conflict.

Nevertheless, on the basis of this single criterion, Hibbs proceeds to distinguish three basic types of collective bargaining system as appropriate to the task of testing for the effects of institutional variation: namely, decentralized, centralized, and highly centralized. Under the heading of decentralized are included countries characterised by either plant or company bargaining (Canada, the United States, Japan), or by what are termed "anarchic labour-management relations' (France and Italy). Centralized systems are then assumed to be typified by industry-wide or multi-employer bargaining with industry-wide constraints (Belgium prior to 1959, the Netherlands after 1963, and the United Kingdom). Finally, the highly centralized systems comprise those countries where economy-wide or industry-wide bargaining with economy-wide constraints prevail (Belgium after 1959, Netherlands before 1964, Norway and Sweden). These classifications are summarized in Table 3.3.

Table 3.3
Hibbs' Classification of Industrial Relations systems

Decentralized	Centralized	Highly-Centralized
US	Belgium (pre-1959)	Belgium (post 1959)
Canada		Netherlands (pre-1963)
Japan	Netherlands (post-1963)	Norway
France	UK	Sweden
Italy		

Source: Hibbs (1976)

On the basis of these classifications, Hibbs re-specifies his basic estimating equation to allow for the possibility of parameter variation across different industrial relations systems, although his assumption of equivalence through time is maintained. To accomplish this two dummy variables are introduced: the first takes the value of unity for centralized collective bargaining systems, and zero otherwise; the second takes the value of unity for highly centralized systems, and zero otherwise. Decentralized systems then comprise the null case. Inclusion of these dummy variables in the original estimating equation produces an expanded equation of the following form:

$$SV_t = a_0 + a_1 \sum_{i=1}^{5} \mu_i \Delta R_{t-i} + b_1 \sum_{i=1}^{5} \pi_i (\Delta R_{t-i} * D_1) + c_1 \sum_{i=1}^{5} w_i (\Delta R_{t-i} * D_2)$$
$$+ a_2 U_t + b_2 (U_t * D_1) + c_2 (U_t * D_2)$$
$$+ a_3 \Delta C_t + b_3 (\Delta C_t * D_1) + c_3 (\Delta C_t * D_2) + E_t$$

where the additional terms in D_1 and D_2 are the adjustments for centralized and highly centralized systems respectively.

Estimation of this unconstrained model produces insignificant coefficients on all of the adjustment terms, leading Hibbs to conclude that his initial assumption of parameter equivalence on real wages, unemployment and profits across diverse industrial relations systems was broadly correct. That this is a totally inadequate test of such a proposition, however, is revealed by a closer examination of Table 3.3.

The inadequacy of the procedure of selecting one aspect of the industrial relations environment as a classification device has already been noted. This inadequacy becomes readily apparent when viewed in relation to the strange bed fellows produced in Table 3.3. Thus, under the heading of 'decentralized' are to be found both France and Italy, and the United States and Canada - systems which other writers (including, of course, Ross and Hartman) have gone to considerable lengths to demonstrate as institutionally distinct.[12] This miscategorization is carried even further by the inclusion of the U.K. under the heading of centralized,[13] thereby totally ignoring the pronounced shift towards decentralized plant level bargaining that has occurred in the private sector since the war.

Also under the heading of centralized, Hibbs includes Belgium prior to 1959, and the Netherlands after 1963; however, in neither case is any attempt made to justify the historical periodicity employed. In the case of Belgium, Hibbs' division does, in fact, coincide with the introduction of the economy-wide social programming accord, and the growth of interindustry and interprofessional agreements at the national level (Blanpain 1973, Molitor 1978). However, as Weber (1964) has argued, the increased centralization of formal

negotiations in larger units does not necessarily reduce the operational autonomy of lower levels.[14] Thus, in the case of Belgium, it has been argued that while the period of the 1960's was undoubtedly characterised by increasing official emphasis on centralized bargaining structures, it also witnessed an important de facto shift towards increased bargaining activity at industry and plant level (Molitor 1978). In view of this, Hibbs' selection of 1960 as marking a dividing line between 'centralized' and 'highly-centralized' systems appears somewhat dubious.

In the case of the Netherlands, the period from 1958 to 1963 has frequently been cited as one during which the highly structured system of centralized wage determination finally broke down, giving way to a more decentralized system of bargaining, (de Wolff 1967, Ulman and Flanagan 1971, Pepper 1975). Given this, the introduction of an historical dividing line in 1963 would appear much more reasonable. However, by introducing the possibility of such an institutional shift, Hibbs effectively begs another important question in relation to the adequacy of his specification and the use of the pooling technique: namely, the possibility of parameter variation across time as well as across countries.[15] Nowhere does Hibbs attempt to test for this possibility.

In view of these criticisms it is difficult to give any statistical credibility to Hibbs' finding of parameter equivalence on economic variables across diverse systems of industrial relations. Moreover, even if he had successfully established parameter equivalence for economic variables, it would still not necessarily follow that this equivalence could be generalised

to cross-country responses to political variables. However, Hibbs proceeds on the basis of just such an assumption in testing an equation supplemented with a variety of political indicators.

As indicated above, the political factors singled out for particular attention by Hibbs are the relative status of labour-oriented parties on the non-communist left; the presence or otherwise of governments controlled outright by socialist, social democratic or labour parties; and the extent of communist party influence. Again drawing upon the work of Ross and Hartman, Hibbs suggests that where labour oriented parties are serious contenders for political power, the use of the strike weapon is likely to be restrained. A similar argument applies in the case of the existence of labour oriented governments. Here, as well as the desire of organized labour not to do anything to prejudice the performance of its own party, there is the added possibility of furthering the collective demands of workers by legislative enactment.[16] Finally, with respect to communist party influence, Hibbs argues that insofar as these act as, 'important agencies for the mobilization of discontent and the crystalization of labour-management cleavages', their presence will be associated with an escalation in conflict.

Incorporating these hypotheses into Hibbs' basic estimating equation produces the following operational specification:

$$SV_t = a_0' + a_1 \sum_{i=1}^{5} \mu_i \Delta R_{t-i} + a_2 U_t + a_3 LI^* E_t + a_4 LG^* E_t + a_5 CP_t + E_t$$

with $a_1, a_2, a_3, a_4 < 0$; $a_5 > 0$.

All economic variables are as previously defined. In terms of the political variables: $LI_t{}^*E_t$ is a labour-socialist party incentive index, operating during election years (E_t), and measuring the extent to which such parties are successful in dampening industrial conflict. This incentive is in turn defined to depend non-linearly on the difference between the labour-socialist vote share and the largest 'tendence' in the system, so that for large share distances the index is assumed to asymptotically approach zero; while as the share distance narrows the index approaches the value of one. LG^*E_t is a simple labour-socialist government dummy, taking the value of one during periods when such parties are in power, and zero otherwise. Again, the variable is constrained to operate only during election years (E_t). Finally, CP_t is a variable representing the influence of communist parties. The actual specification takes a fairly complex exponential form, and is designed to capture the effects of the existence of a lower threshold membership below which influence is negligible, as well as an upper bound - or 'grievance exhaustion point' - beyond which incremental increases in membership have little or no additional impact on strike activity.

Empirical tests of the above equation (see Table 3.1, page 3.7) reveal a negligible influence on strike volume for either the incentive index, or the labour-socialist government dummy. Moreover, these findings are unchanged even when their effects are not constrained to election years. With respect to the effects of communist party influence, while Hibbs finds little empirical support for his original threshold/grievance exhaustion formulation, an alternative unbounded specification does produce significant positive esti-

mates for the effects of communist parties, leading Hibbs to conclude that the latter are indeed associated with levels of strike activity beyond those attributable to purely economic factors.[17]

To summarize, on the basis of his estimations, Hibbs concludes that workers in advanced capitalist countries appear to exercise considerable sophistication in the use of the strike weapon. Thus, his findings are interpreted as indicating that strikes are largely immune from money illusion - occurring as a response to real rather than nominal magnitudes - and are timed so as to exploit the strategic advantages of tight labour markets. Moreover, he contends that such rational calculative behaviour underlies fluctuations in strike action irrespective of the prevailing institutional environment.

Unfortunately, given the serious inadequacies both in the specification and the testing of Hibbs' model, these conclusions cannot be sustained solely on the basis of the evidence he presents. The most appropriate conclusion would therefore appear to be one of 'not proven'. Indeed, this verdict is further justified in the light of the work of Shorter and Tilly (1974) and Snyder (1974, 1975 and 1977), who present both theoretical and empirical evidence which fundamentally contradicts many aspects of Hibbs' work.

The Analysis of Shorter and Tilly

An important contrast between the work of Shorter and Tilly and that of all of the authors considered previously (both in this chapter and in Chapter 2) is the former's view that the strike is an instrument of collective working class action, rather than simply an adjunct to the collective bargaining process. In this connection, and based upon their exhaustive analysis of strikes

in France, Shorter and Tilly argue that the primary purposes of the strike are political rather than economic. Thus, in the short run strike action is seen as intended not to pressure the individual employer, against whom it is ostensively directed, but rather the political authorities, with the aim of promoting state intervention on the side of the workers. In the longer run, on the other hand, while the prospective audience is the same, the primary aim, according to Shorter and Tilly, is to 'forge a path for labour into the decision making apparatus of the state'.

A second major strand of Shorter and Tilly's argument is the notion that the ability to engage in strikes or collective action is limited by the extent of prior organization among workers. However, in contrast to the common assumption by both economists and institutionalist writers[18], this is treated as neither inevitable nor spontaneous, but rather as problematic (Olson 1965).

Combining these two strands of argument leads Shorter and Tilly to suggest that,

> "major accumulations of strikes and disturbances eventuate when it becomes apparent to the working classes as a whole that a point of critical importance for their own interests is at hand in the nation's political life, and when the latticework or organization suffices to transform these individual perceptions of opportunity into collective action."
>
> (Shorter and Tilly, p. 345)

This leads them to formulate a model in which strikes depend positively on labour's organizational strength, or collective control over resources (as proxied by union density), while labour's willingness to mobilize these

resources depends positively on the occurrence of a broadly favourable political climate. Most notable in the latter connection are considered to be events such as cabinet crises and significant accumulations of collective violence.

One obvious potential problem with this model is that while it may appear fairly plausible in the context of French industrial relations, it is less clear that its relevance extends to countries that do not share France's rather idiosyncratic institutional environment (ie. countries whose industrial relations systems are not characterized by historically unstable union membership, poorly institutionalized collective bargaining, and active state intervention in the employment relationship).[19] Nevertheless, Shorter and Tilly seek to claim a wider relevance for their analysis. By viewing the strike as a largely political weapon, and politics as the truly strategic variable,[20] they effectively relegate the details of the institutional environment to a consequential rather than causal role.[21] The significance of this emphasis is that it enables them to discount the effects of 'French exceptionalism' - at least as far as the occurrence of strikes and the applicability of a political action approach is concerned - and thereby justify the explanation of inter-country differences in strike patterns purely on the basis of variations in the political representation of their working classes.

In constructing this comparative argument, Shorter and Tilly employ post-war data on the three dimensions of strike activity - relative frequency, average duration and average size - to delineate three distinct country groupings, each of which is hypothesized to correspond to a different relationship between workers and the polity. In the first group are placed France

and Italy. In these countries the predominant pattern of short, large and frequent strikes, contributing to a substantial overall volume of time lost, is seen as deriving from the actions of a newly organized and politically impotent working class, forced in the absence of effective political representation to use protest strikes as a means of pressing its political demands.

At the other end of the spectrum are placed Germany, Sweden and the Netherlands. In these countries, Shorter and Tilly argue, labour's entry into the polity has effectively produced the diminution of strike activity to virtual insignificance 'making the strike a rarity in the average worker's experience'. Two reasons are advanced to account for these developments. First, workers are able to use parliamentary suasion rather than strikes as a means of pressing political demands; and second, worker-based parties have given organized labour direct power to intervene in the industrial arena to safeguard workers' interests.[22]

The third group of countries comprises the United States and Canada. Here the predominant strike pattern of intermediate size and frequency, but considerable duration, is associated with the existence of business unionism,[23] 'where the strike has a fundamental role to play within the collective bargaining process, yet few political functions'.

In addition to these three groups, two ambiguous cases are also noted. In the case of Belgium, though strikes occur only very infrequently, as in Sweden and the Netherlands,[24] their large size and short duration is seen as consistent with a continuing role for political protest. This is attributed in part to the instablility of worker political representation in the central

polity. In the other case, namely that of Britain, the occurrence of frequent, brief and fairly small 'wildcat-quickie' strikes is seen as reflecting shop-floor protest over plant-level authority relationships, which though 'seemingly over wages and hours ... are fundamentally localized protests over the distribution of power'. Once again, therefore, Shorter and Tilly emphasize the essentially political rather than economic nature of the strike (at least outside the context of North America), albeit in this case at the local level.

The implications of this analysis for the likely determinants of short-run fluctations in strike activity may be summarised as follows:

Table 3.4

Hypothesized Determinants of Short-Term Variation in Strike Activity: The Implication of Shorter and Tilly's Political Action Approach

Strikes primarily responsive to:	Political/ Organizational Variables	Economic Variables	No Systematic relationship
Country	France Italy	Canada U.S. (U.K.)	Germany Netherlands Sweden (Belgium)

In France and Italy, labour's effective exclusion from the polity, as well as unstable unionism, implies that political and organizational variables are likely to be the prime determinants of strike fluctuations. By contrast, in the Netherlands, Germany, Sweden and also (though to a lesser extent) in

Belgium, where 'the strike has ceased to be of any practical relevance either as a form of political protest, or as a means of shop-floor collective bargaining pressure', the logical implication would seem to be the absence of any systematic relationship with either political or economic variables. As far as Britain is concerned, despite the presumed micro-political orientation of the strike, consistency with available empirical evidence[25] would seem to require that their timing, at least, must be considered as subject to prevailing economic conditions.

It is, therefore, only in the case of the United States and Canada that the strike is seen as an unambiguously economic phenomenon. To explain this, Shorter and Tilly suggest that it is only in these two countries that labour has effectively come to reconcile itself to "a watertight division between job action, where the mechanisms of free collective bargaining ... function unobstructed by government intervention, and political action ... executed through interest-coalition political parties" (p. 330). It is this effective 'institutional isolation' of industrial conflict (Dahrendorf 1959), based in large part on historic traditions of government non-intervention, which is seen as giving modern North American strikes their uniquely economic character.

As Shorter and Tilly emphasize, however, this has not always been so. They argue that, "in contradistinction to the dominant doctrine of 'economism', before the Great Depression collective action was as much political as economic, intended equally to build political organization and press political demands" (p.329). Entry into the polity is, therefore, seen as

having transformed this situation to produce a unique politico-economic configuration - an interpretation which, as we shall see, has been utilized in subsequent work.

To summarize, Shorter and Tilly's analysis fundamentally questions the universal application of a primarily economic calculus to the explanation of international fluctuations in strike activity. In particular, it is strongly implied that its relevance is confined mainly to North America and, though for somewhat different reasons, also Britain. Thus, while Shorter and Tilly's work does not specifically challenge the findings of any of the single country studies considered above, it does fundamentally question their universal generalization as in the work of Hibbs. Moreover, in further contrast to Hibbs, the crucial distinguishing characteristic of industrial relations systems is drawn not in terms of institutional factors such as the centralization of collective bargaining, but rather in terms of the nature of labour's relationship to the polity. As is evident from a comparison of Tables 3.3. and 3.4, these criteria produce significantly different country groupings.

In assessing the seriousness of this challenge to the universal application of economic models in general, and to Hibbs' work in particular, several significant weaknesses in Shorter and Tilly's analysis must be kept in mind. First, their assumption that strikes primarily serve labour as a means of political action is highly debatable, and is just as unsatisfactory as the economist's preoccupation with purely monetary issues. Second, as Shalev

(1980) has emphasised, Shorter and Tilly fail to explain convincingly why union leaders, or their members, might be willing to sacrifice the strike weapon just because the labour movement has acquired politcal legitimacy. Shorter and Tilly simply assume that this alters class power to an extent sufficient to make political action a genuine alternative to industrial action. However, the substantial differences in conflict experience within countries where labour has supposedly entered the political arena, as well as the recent upsurges in conflict that these countries have experienced, suggests that worker acquisition of political power and its effects on strikes is a much more complex and differentiated phenomena than Shorter and Tilly imply. Finally, on a purely practical level, no systematic empirical evidence is provided to support the validity of their hypotheses outside of the historical context of French industrial relations. Their interpretation, in short, is simply asserted. For a more quantitative evaluation of their hypotheses it is necessary to turn to the work of Snyder (1974, 1974 and 1977).

The Analysis of Snyder

The basic feature of Snyder's analysis is his argument that the determinants of temporal fluctuations in industrial conflict will vary on the basis of three factors: first, the extent and stability of union membership; second, the national political position of labour; and third, the degree of institutionalization of collective bargaining.[26] To establish this argument he starts from the premise that the hypotheses advanced by economists in orthodox bargaining models to link strikes with changes in economic activity are based

upon a number of highly specific, yet unstated, assumptions about the nature of the institutional context. However, he suggests that these economic hypothesis will only prove satisfactory to the extent that the unstated assumptions actually hold. Thus, Snyder argues that it is only where union membership is large and relatively stable, where the political position of labour is firmly established, and where collective bargaining is well institutionalized, with both parties prepared to negotiate, that unions will be in a position to make the type of short-run economic cost calculations envisaged in economic models of the bargaining process. By contrast, where neither unions nor collective bargaining are accepted, union membership is unstable, and labour is denied political access through more discrete and routinized channels, such calculations are unlikely to be made. Under these circumstances, he suggests, longer-run political goals such as polity membership are more salient to labour, with the consequence that an organizational/political model of the type suggested by Shorter and Tilly will be more relevant.

These basic hypotheses and their implications for the short-run determinants of strike fluctuations are summarised in Table 3.5.

Table 3.5

Ideal Types of Institutional Setting and Their Consequences for Models of Strike Fluctuations

Institutional Characteristics	Type A	Type B
Collective-bargaining	well-institutionalized	poorly institutionalized
Trade Unions	large, stable membership	small, unstable membership
Political Position of labour	legitimate interest-group; routine participation	illegitimate interest-group
Consequences	economic strength secure	economic strength problematic
	economic ends primary focus of attention	political ends primary focus of attention
	Strikes fluctuate in response to changes in economic conditions	strikes fluctuate in response to organizational strength and political change

Source: Snyder 1975 (p. 267)

Two serious weaknesses in Synder's analysis are immediately apparent from this table. First, labour's organizational power is estimated, following Shorter and Tilly, solely by union membership. However, this is to ignore the fact that power is not merely a function of the relative size of the union movement. In addition to simple membership figures, attention must also be paid to such factors as the unions' occupational base, and the presence or otherwise of political, religious cultural or linguistic divisions.[27] Moreover, in the political arena, organizational power will further depend upon

such factors as the extent of working class voting, and the electoral strength of left parties, as well as the degree of unity both within and between the industrial wings of the labour movement (Shalev and Korpi 1979).

The second weakness revolves around Snyder's rigid dichotomy between well institutionalized and poorly institutionalized systems of collective bargaining. In addition to being an excessively simplistic division, it is also based upon a definition of institutionalization which totally ignores the prevailing structure of bargaining. Thus, while this is obviously not the only relevant factor in distinguishing among industrial relations systems, as is implied for example by Hibbs, it is certainly too important a factor to totally ignore. Nevertheless, it is on the basis of the factors outlined in Table 3.5 that Snyder proceeds to a classification of the four countries included in his study. Thus he proceeds to classify the industrial relations systems of the four countries chosen for his analysis - namely, France, Italy, Canada and the United States - under one or other of his suggested 'ideal types', as a preliminary to his examination of the determinants of variations in their respective strike incidence.

Specifically, Snyder suggests that the 'Type A' institutional arrangements depicted in Table 3.5 - and hence the assumptions of economic bargaining models - are most appropriate to the post-war experience of the two North American countries, as well as of the countries of Northern Europe. Coincidentally, therefore, these assumptions are seen as having held to a significant, if differentiated, extent for the recent experience of two of the

countries on which most quantitive work has been based.[28] 'Type B' arrangements are then seen as appropriate to the experience of France and Italy, where, it is argued, the entire framework of assumptions essential to the performance of an economic model clearly breaks down. In addition to France and Italy, Snyder draws upon the earlier analysis of Shorter and Tilly to suggest that the pre-war institutional contexts of both the United States and Canada were also largely characterised by 'Type B' arrangements.

On the basis of these classifications, Snyder formulates two empirically testable hypotheses. First, that economic variables will have little explanatory power in any of the four countries prior to World War II, and that strike frequency will respond primarily to organizational and political variables. Second, that for the United States and Canada this situation will be reversed for the post-war period, with strike frequency responding primarily to economic conditions; while in France and Italy the pre-war pattern will be maintained.

Snyder attempts to test the validity of these propositions in two studies; the first using time series data for France (1876 - 1937; 1946 - 1966), Italy (1901 - 1924; 1947 - 1970)[30] and the United States (1900 - 1948; 1949 - 1970) (Snyder 1975); and the second using data for Canada (1912 - 1948; 1949 -1971) and the United States (1900 - 1948; 1949 - 1971) (Snyder 1977).

In both studies the operational specification of his regression equations is broadly the same:

$$S_t = a_0 + a_1 X_t + a_2 \sum_{i=1}^{6} \mu_i \Delta R_{t-i} + a_3 M_t + a_4 P_{1t} + a_5 P_{2t} + a_6 T + E_t$$

Where S_t is strike frequency (expressed in logarithmic form in the earlier study)[31]; X_t is either the unemployment rate, or, in the case of Italy and France, the level of national income[32] as an indicator of labour market tightness; and $\sum_{i=1}^{6} \mu_1 \Delta R_{t-i}$ is a six year lagged moving average of the percentage change in real wages, proxying the effect of the expectation-achievement gap. This economic component of the model is broadly analogous to that of Ashenfelter and Johnson (1969)[33], and embodies the conventional economic assumptions that strike rates rise when real wages lag and fall when declining labour market tightness reduces labour's bargaining advantage.

With respect to the organizational/political component of the model, M_t is union membership, expressed as a percentage of the civilian labour force, proxying labour's organizational resources and capacity for collective action. This variable is interpreted as follows: since organization is a fundamental prerequisite to strike action, where this is problematical as in France and Italy over the entire period, and in the United States and Canada for the pre-war period, fluctuations in unionization will be positively associated with fluctuations in strikes. On the other hand, where organization is secure, there will be no necessary relation with the occurrence of strikes.

Turning to the political variables, while supposedly proxying similar phenomena, they are in fact given country-specific definitions. In the case of Italy and France, they represent the number of cabinet changes (P_1), and

the existence of election years (P2), with predicted positive coefficients for both pre-war and post-war periods. The rationale for this interpretation is that these events mark propitious times for the strategic exercise of collective action. By contrast, for the United States they represent the percentage of Democrats in Congress (P1), and the Party of the President (P2). Here it is assumed that the existence of a political constellation favourable to labour (i.e. Democrat) will, in the absence of labour's acceptance into the polity, cause escalations in strike activity. Once entry is achieved, however, as in the post-war period, this relationship is assumed to be attenuated, since political demands are routinely expressed via such activities as lobbying.[34] Finally, in the case of Canada, only one political variable is included, namely the percentage of Liberals in Parliament, although for the earlier period a dummy variable for the War years is also included. The first of these variables is assumed to be associated with increased strike activity during the pre-war years, for reasons analogous to those presented in the context of the United States, while the War dummy is assumed to depress strike activity. The two remaining variables in the estimating equation represent the trend term T, and the disturbance term E_t.

Snyder's results are summarised in Table 3.6. It is immediately clear from this table that, except in the case of the United States, none of his regressions is overwhelmingly supportive of his predictions. In the case of France, for example, while unionization and the presence of an election year are both significant and positively signed for the pre-war period, no variable - organizational, political or economic - even approaches signficance during

the post-war period. On the basis of Snyder's findings, therefore, Shorter and Tilly's organizational/political model appears inconsistent with post-war strike experience even in the country for which it was specifically formulated.

Turning to the case of Italy, while the unionization variable is significant in both pre and post-war periods, apparently lending support to the organizational component of the model, neither political variable is significant. Consequently, all that these equations indicate is that workers strike when they have the capacity to do so. They offer no clue as to whether the strategic factors motivating this action are political or economic.

In the case of Canada, while neither organizational, political, nor economic factors are significant for the pre-war period, two factors severely limit the usefulness of this result. First, there is the exclusion of any measure of labour market tightness because of data limitations. Second, and undoubtedly related to this omission, is the presence of an unacceptably high degree of autocorrelation in the equation, despite the substitution of a generalized least squares estimation procedure for that of ordinary least squares.[35] Turning to the post-war period, both the real wage variable and unionization are significant, while unemployment and the percentage of Liberals in Parliament are not. Once again these findings are inconsistent with Snyder's predictions. Further, they are also inconsistent with the findings of other studies (Smith 1972, 1976; Walsh 1975; Cousineau and Lacroix 1976) all of which report the successful performance of a purely economic model in Canada during the post-war period.

Table 3.6
Significance of Estimated Regression Coefficients for Economic, Organizational and Political Determinants of Strike Frequency: France 1876-1937 and 1946-1966; Italy 1901-1924 and 1947-1970; the US 1900-1948 and 1949-1971 and Canada 1912-1948 and 1949-1971.

	U_t	$\sum_{i=1}^{6} \Delta_{R_{t-i}}$	M_t	P_{1t}	P_{2t}	T	R^2
France (log) (OLS)							
1867-1947	-†	-	+**	$+_1^1$	$+_2^2$	+**	0.4358
1946-1966	+†	+	+	+	-	-	0.2011
Italy (log) (OLS)							
1901-1924	+†	-	+**	$+_1^1$	$+_2^2$	-**	0.7061
1947-1970	-†	-	+**	-	-	-	0.8587
United States							
OLS 1900-1948	-	+	+**	$+_3^3$	$+_4^4$	-**	0.754
INVA 1900-1948	-*	+**	+**	$+_3$	$+_4$	-**	0.755
OLS 1949-1971	-**	-*	-	$-_3$	$-_4$	-	0.693
INVA 1949-1971	-**	+*	+	-	-	+	0.685
Canada							
GLS 1912-1948	0	-	+	$-_5^5$	$-^6$	+	0.155
OLS 1949-1971	-	-*	+*	+	0	+**	0.949

Source: Snyder (1975, 1977)

OLS = Ordinary Least Squares
INVA = Instrumental Variables Technique
GLS = Generalised Least Squares

* significant at 0.05 level
** significant at 0.01 level
0 not entered in regression

† national income; 1. cabinet changes; 2. election years; 3. % Democrats in Congress; 4. Party of President (1 = Democrat; 0 = Republican); 5. % Liberals in Parliament; 6. War years.

To explain these unexpected results, Snyder points to the existence of a highly significant positive trend term to suggest, following Walsh (1975), that Canadian labour-management relations are still not well institutionalized. He then argues that until more widespread institutionalization occurs, both economic and organizational variables will have a strong impact

on strike fluctuations. In the absence of concrete supporting evidence that is independent of the findings of his regression equation, however, such post hoc rationalizations are hardly convincing. Moreover, there is an alternative explanation for Snyder's results which is equally plausible. Namely, that the unionization term is simply passing on the effects of economic conditions, since it is well established that Canadian union density is itself a function of several key components of the business cycle (Swidinsky 1974; Bain and Elsheikh 1976).

In the final analysis, it appears that it is only in the case of the United States that Snyder's results are at all supportive of his thesis. Thus, during the pre-war period, Ordinary Least Squares estimation reveals that unionization, the percentage of Democrats in Congress, and the Party of the President are all significant and carry the expected positive signs; while neither unemployment nor real wage changes are significantly related to strike fluctuations. From this Snyder argues that the standard economic interpretation of pre-war U.S. strike activity is seriously mispecified, and that Shorter and Tilly's organizational/political model is more relevant given the prevailing institutional arrangements. One fundamental problem that arises in connection with these findings, however, as with those reported previously, is the possibility that the causal relationship between unionization and strike activity is actually the reverse of that suggested by Snyder. That is, rather than union membership preceding strike activity, strikes (especially successful ones) may actually serve to draw workers into unions.[36]

In an attempt to tackle this problem, Snyder re-estimates his equations for the U.S. using the technique of instrumental variables.[37] Specifically, drawing on Ashenfelter and Pencavel's model of union growth (1969), he constructs an instrument for union membership based upon the consumer price index, current and lagged levels of employment in the unionizable sectors of the economy, the civilian unemployment rate at the most recent business cycle trough, and the percentage of Democrats in Congress. However, in addition to being a totally irrelevant test of the direction of causality between unionization and strikes, construction of this instrument merely serves to re-emphasize the possibility that the estimated relationship between strikes and unionization derives not from a direct relationship, but from the latter variable's mutual dependence on economic conditions. This being the case, Snyder's findings cannot be taken as disproving the relevance of these conditions.

Turning to the post-war period, Snyder obtains significant and correctly signed coefficients on both unemployment and real wage variables, thus matching the findings of other studies (Ashenfelter and Johnson 1969, Skeels 1971). Moreover, in line with his predictions, neither unionization nor political indicators are significant.[38]

Snyder interprets these findings as strongly supportive of his <u>a priori</u> predictions about the respective determinants of 'early' and 'recent' strikes in the United States. In addition to the specification problems already cited, however, others may be raised. First, as Smith (1979) has argued, Snyder makes no attempt to justify the historical periodicity he adopts in drawing a dividing line between 'institutionalized' and 'pre-institutionalized' systems, or in locating organized labour's entry into the polity.

Problems also arise if institutionalization in Snyder's terms and entry into the polity are not temporally coincident.[39] Indeed, this possibility further emphasizes the fact that any attempt to introduce a rigid dichotomy between institutionalized and pre-institutionalized systems, whether inter-temporal or international, is likely to be a hazardous procedure. The process of institutionalization is far too complex and diverse a phenomenon for this kind of simple categorization to be meaningful.

A useful illustration of the latter point is provided in the context of the United States by Edwards (1978). Edwards specifies not two, but three distinct sub-periods: early (1890-1910), transitional (1900-1939), and modern (1946-1972). The last two periods broadly replicate those analysed by Snyder, while the earlier period is included to examine whether or not the period prior to 'institutionalization' is actually as homogeneous as Snyder implies. Using a modified economic and organizational/political model, Edwards fits several different specifications to obtain independent estimates of its economic, economic plus organizational, and political components. On the basis of his findings, Edwards concludes that economic variables in the form of an unemployment-based business cycle trough indicator[40] and the real wage level[41] have played a significant role in each of the three periods, although their effects have not always been in the same direction.

With respect to the influence of worker organization - as proxied by union density - Edwards finds a significant influence only for the earlier period 1881-1899. Thereafter, the variable is consistently insignificant, and for the transitional period 1900-1939 also wrongly signed.[42] Finally, esti-

mates for the political components of Edwards' model produce significant positive coefficients for only the Party of the President in the earlier periods, while for the most recent periods the percentage of Democrats in Congress actually appears significant in reducing strikes. The latter possibility, namely that the institutionalization of collective bargaining and labour's entry into the polity will not so much eliminate the relevance of political variables, as change the nature of their significance toward the suppression rather than the aggravation of conflict, is not considered by Snyder.[43]

To summarise, Edwards' findings cast considerable doubt over the relevance of Snyder's rigid distinction between institutionalized and pre-institutionalized settings in terms of their impact on the determinants of strike activity in the United states - the country whose strike experience on the face of it appeared to be most supportive of Snyder's interpretation.[44] Moreover, given the ambiguous nature of Snyder's results in relation to the other countries in his study, this conclusion would appear to be capable of generalization to an international context. In addition, Edwards' results also call into question the relevance of union density as an 'additional' explanatory variable in relation to strike fluctuations. Given the considerable conceptual and empirical problems associated with the use of this variable, this result is not surprising.

In general, the overall assessment on Snyder's work must be one of not-proven. However, despite the many criticisms that can be made of both the specification of Snyder's model and his empirical findings, his work neverthe-

less represents an ambitious attempt to go beyond the narrow confines of a purely economic approach to the explanation of strike fluctuations. It also represents one of the few attempts, apart from the work of Hibbs, to apply quantitative techniques within a comparative framework. Thus, in contrast to the contributions of Ross and Hartman and Shorter and Tilly in this area, Snyder has attempted to go beyond a simple reliance on ad hoc explanations based upon the plausibility of supportive examples and towards the use of predictive - and hence falsifiable - models which seek to provide quantitative evidence on both the regularity and magnitude of hypothesized relationships.

Conclusions

This chapter has critically examined two major econometric studies of comparative strike fluctuations: namely, those of Hibbs and Snyder. While both studies seek to look beyond a narrowly economic perspective by incorporating a variety of political variables, and in the case of Snyder also organizational variables, they adopt markedly different perspectives on the importance of the institutional environment. In the context of Hibbs' analysis, drawing selectively on the work of Ross and Hartman, the prevailing bargaining structure - and specifically the degree of centralization or decentralization of collective bargaining - is singled out as the sole potential institutional source of variation underlying comparative strike fluctuations. In practice, however, its influence is rejected in favour of the hypothesis of parameter

equivalence across industrial relations systems based upon a predominantly economic calculus. Political variables, with the notable exception of the presence of communist parties in mobilizing increased industrial confict, are similarly dismissed.

Snyder's analysis, on the other hand, drawing on the work of both Ross and Hartman and Shorter and Tilly, postulates three features of the institutional enviornment as crucial to the process underlying strike fluctuations: namely, the organizational strength of the unions; labour's relationship to the polity; and the degree of institutionalization of collective bargaining. These are then used to produce intertemporal and international distinctions between pre-institutionalized and institutionalized labour relations systems. Empirical tests appear to confirm in general, though not in detail, at least some relevance for institutional differences. This confirmation is, however, essentially negative in character, suggesting the absence of any major significant economic influence on strike fluctuations in pre-institutionalized systems such as those of France and Italy and the pre-war United States and Canada, rather than the specific relevance of organizational and political factors.

These contradictory findings make the drawing of any firm conclusions difficult, the more so since theoretical, methodological and statistical weaknesses in both studies cast grave doubts over both the reliability of their empirical results and the conclusions they derive from them. Moreover, comparative evaluation is further complicated by their use of markedly different estimating techniques and country samples. Thus, Hibbs' results derive from

an 'average' relationship prevailing across a ten-country sample, while Snyder's results are based upon individual studies of a subset of ony four of these countries. Highly institutionalized systems such as those of Sweden, the Netherlands, Germany and Belgium are totally ignored by Snyder.[45]

In view of these difficulties, the drawing of firm conclusions on such matters as the importance of variations in the institutional enviornment, and the universal applicability of a primarily economic decision calculus to explaining strike fluctuations, is best postponed - at least pending the consideration of the additional evidence presented in Chapter 4, and the specification and testing of a more comprehensive comparative strike model in Chapters 5 and 6.

Footnotes to Chapter 3

1. The classic study in this genre is the work of Ross and Hartman (1960). Subsequent contributions include: Shorter and Tilly (1974); Clegg (1976); Hibbs (1978); Ingham (1974) and Kassalow (1977).

2. The problems inherent in the pooling technique are discussed in A. Koutsoyiannis, Theory of Econometrics, Macmillan, London, 1977.

3. See S. Almon, 'The Distributed Lag Between Capital Appropriations and Expenditures', Econometrica, vol. 33, 1965, pp. 178-96. Hibbs specifies a second degree polynomial with the estimated coefficients tapering to zero after 5 years.

4. The extrapolative expectations specification implies a strike equation of the following form:

$$SV_t = \beta_0 + \beta_1(\Delta R_{t-1} - \Delta R_{t-2}) - \beta_1\gamma(\Delta R_{t-2} - \Delta R_{t-3}) + \beta_2 U_t + \beta_3 \Delta C_t + e_t$$

$$\beta_1 < 0 \ , \quad 0 < \gamma < 1 \ , \quad \beta_2 < 0 \ , \quad \beta_3 < 0 \ .$$

5. The adaptive expectations plus trend specification implies a strike equation as follows:

$$SV_t = \beta_0(1 - \lambda - \delta) + (\lambda + \delta)SV_{t-1} + \beta_1(\Delta R_{t-1} - \Delta R_{t-2}) - \beta_1\delta\ \Delta R_{t-2} + \beta_2 U_t - (\lambda + \delta)\beta_2\ U_{t-1} + \beta_3 \Delta C_t - (\lambda + \delta)\beta_3 \Delta C_{t-1} + (e_t - (\lambda + \delta)e_{t-1})$$

$$0 < (\lambda + \delta) < 1 \ , \quad \beta_1 < 0 \ , \quad 0 < \delta < 1 \ , \quad \beta_2 < 0 \ , \quad \beta_3 < 0 \ .$$

6. Equations in strike volume typically have lower explanatory power than those in strike frequency. This derives from the fact that strike volume is a composite strike measure made up of three components: frequency, size and duration i.e.

$$\text{Volume} = \underset{\text{(frequency)}}{\text{number of strikes}} \times \underset{\text{(size)}}{\frac{\text{Workers involved}}{\text{number of strikes}}} \times \underset{\text{(duration)}}{\frac{\text{Volume}}{\text{workers involved}}}$$

Since strike size, and to a significant though lesser extent also strike duration are dependent on institutional factors, they are much less responsive to business cycle fluctuations than frequency.

7. See for example, Ross and Hartman (1960); Ingham (1974); and Clegg (1976).

8. Subsequent writers have argued that this finding is, in any event, largely a statistical artifact based upon a narrow and misleading set of strike indicators. See Hibbs (1976) and Ingham (1974).

9. These developments have been referred to collectively as a process of embourgeoisement (Goldthorpe and Lockwood et al 1968).

10. To quote Ross and Hartman, 'When we say that a certain factor is conducive to industrial peace or industrial conflict, we mean that it has this effect in combination with other influences with which it is characteristically conjoined. The context is crucially important.' (Ross and Hartman, 1960, p. 175).

11. See for example Clegg (1977) and Kassalow (1977).

12. See also: Shorter and Tilly (1974); Snyder (1975); and Korpi and Shalev (1979).

13. This error is also committed by Ross and Hartman.

14. This notion also underlies the findings of the Donovan Commission Report in Britain.

15. It is interesting, in this connection, that Hibbs' study ends in 1969, the year before the strike explosion in Britain that effectively undermined the predictive power of the basic Ashenfelter and Johnson model.

16. An additional possibility, emphasized elsewhere by Hibbs, is a shift in the locus of distribution from the industrial to the political arena. See Hibbs, D.A. 'On the Political Economy of Long-run Trends in Strike Activity', British Journal of Political Science, Vol. 8, No. 2, 1978, pp. 153-75.

17. It is not intuitively obvious that this result necessarily derives from a direct causal relationship running from the communist party variable to strikes.

18. This issue has received very little attention from economists. In all the economic models referred to above, for example, a sufficient capacity for collective action is simply assumed.

19. See Table 3.2 on page 3.9.

20. Shorter and Tilly (1974), page 396, para. 1.

21. In this sense their work contrasts strongly with that of Ross and Hartman (1960).

22. These arguments are directly analogous to those advanced and tested by Hibbs (1978).

23. As Bell (1961) defined the term, 'unions whose aspirations do not transcend the maximization of their members' incomes through aggressive collective bargaining'.

24. Germany, it should be recalled, does not record strike frequency.

25. See Chapter 2, and in particular the findings of Pencavel (1970); Hunter (1973); and Shorey (1977).

26. The choice of these factors clearly indicates Snyder's debt to the earlier analyses of Ross and Hartman (1960) and Shorter and Tilly (1974).

27. For example, reference might be made to the existence of cultural, linguistic, political and religious divisions in Belgium; cultural and linguistic divisions in Canada; political and religious divisions in France, Italy and Japan; craft divisions in Britain and the U.S. (before 1956); and to religious divisions in the Netherlands.

28. Thus, in Snyder's terms, one explanation for the poor performance of the economic model in Britain after 1967 might be the breakdown of some of the underlying assumptions.

30. The large break in the series (1925-1946) corresponds to the absence of reliable strike information and unionization data for the Fascist period, during which strikes were illegal and systematically suppressed.

31. The logarithmic transformation is justified on the grounds of the existence of substantial skewness in the strike measures in France and Italy. Snyder does, however, suggest that the substantive conclusions derived from his estimation are insensitive to the functional form employed.

32. Use is made of this variable in the absence of reliable unemployment data for France and Italy before 1920 and 1922 respectively. No justification is given for the substitution in later periods.

33. Except for the omission of a profits variable.

34. This, and the preceding argument, runs counter to that advanced by Hibbs (1976), which suggest that pro-labour parties and governments will cause a reduction in conflict.

35. For a discussion of the generalised least squares procedure (G.L.S.) see A. Koutsoyiannis Theory of Econometrics, Macmillan, London, 1977 pp. 218-20 and 471-3.

36. This possibility is suggested by Olson (1965), p. 80.

37. For a discussion and critique of the instrumental variables technique see A. Koutsoyiannis (1977).

38. It is interesting to note that though insignificant, the estimated coefficients on the political variables are consistent with a depressive effect on strikes.

39. This issue is also considered in Edwards (1978).

40. Though not identical, this formulation is similar to that employed by Ashenfelter and Pencavel (1969) in their study of trade union growth in the United States.

41. The real wage level is used as an indicator of worker prosperity.

42. The issue of multicollinearity clearly arises, the unemployment variable and union density are likely to be closely related.

43. This possibility is, as we have seen, considered by Hibbs. Moreover, the occurrence of a significant positive coefficient on the percentage of Democrats variable may be seen as a cyclical manifestation of the type of secular development in strike patterns envisaged by both Ross and Hartman (1960) and Shorter and Tilly (1974) in relation to the accession to power of working class parties.

44. It should, however, be noted that Edwards' results also suggest that the effects of economic variables on strikes has been far from consistent over time.

45. Germany is also (curiously) excluded from the analysis of Hibbs.

Chapter 4

Comparative Theories of Strikes and the Pattern of Wage Inflation: A Preliminary Historical Evaluation

As a useful preliminary to the construction of a theoretically more comprehensive comparative theory of strikes, the present chapter introduces a new element into the analysis; namely, that of international experience of wage inflation. Thus, while both strike activity and wage settlements are major outputs of the process of collective bargaining, all of the bargaining models considered in Chapter 2 were concerned primarily with examining both theoretically and empirically the proximate determinants of the former variable. Consequently, little attention was paid to the precise nature of the wage settlements actually arrived at during bargaining, or to the matter of whether or to what extent their magnitude might have been affected by the occurrence of strike action. Indeed, within the context of the Ashenfelter and Johnson model this issue was effectively assumed away by treating the strike purely as an equilibrating mechanism for bringing rank and file expectations into line with management's ability to pay.

It is a fact of historic record, however, that recent increases in strike activity have been closely associated with significant escalations in wage inflation. This fact further emphasizes that, without prejudice to causality, these events might usefully be considered together. The purpose of the present chapter, therefore, is to consider several broadly contrasting historical accounts of recent international trends in strikes and wage inflation. This is a useful exercise for at least three reasons. First, it helps place

recent international experiences in historical perspective. Second, it serves to make explicit contrasting views on the existence and relationships of causality between these variables. And third, it provides useful additional evidence relevant to the task of evaluating the empirical validity of the comparative approaches outlined in Chapter 3.

I. 'Cost-Push' Theories

Two distinct schools of thought may be identified in terms of their predominant view on the causes of recent international experiences of wage inflation, and the associated role of strikes in this process. First, there are those who view world inflation as the aggregate of a series of separate national problems, the causes of which are to be sought at the level of the individual economy. Second, there are those who view inflation as an international monetary phenomenon to be explained primarily by developments at the supra-national or world level.

Proponents of the former view, frequently associated with a cost-push interpretation of inflation, tend to place primary emphasis on trade unions as key agents in the inflation process. In particular, these organizations are often viewed as 'aggressive monopolies' capable of substantially affecting their members' pay and conditions independent of the state of demand in the labour market.

On a practical level, this analysis is seen as broadly consistent both with the apparent breakdown of the Phillips relationship between unemployment and money wages (Phillips, 1958), evident in several countries in the late 1960s, as well as with the simultaneous escalation of industrial unrest.

These developments are also seen by a number of (notably British) economists as symptomatic of the essentially sociological character of recent inflationary experience.[1] That is, the interpretation of inflation as the consequence of distributional dissent within the national economy, expressed through the medium of increased trade union militancy. Thus, a dominant line of causality is traced from domestic distributional conflict, through increased trade union aggressiveness, to strikes, and ultimately to escalating wage inflation. Moreover, in line with the essentially 'sociological' character of this explanation, it is further assumed that the first link in this causal sequence, namely the determination of industrial unrest, is no longer fully comprehensible in conventional economic terms.

As an example of this line of reasoning, Wiles (1973) has attributed inflation to the effects of 'leap frogging' wage claims and settlements based upon inter-union 'rivalry' or 'jealousy'; while Mishan (1974) has pointed to the role of union 'hypersensitivity'[2] over pay differentials leading to the aggressive pursuit of wage demands without any regard to their longer-run economic consequences. In a similar vein, Marris (1972) has emphasized the effects of 'anger' over existing inequalities in income distribution, and 'frustration' over slow rates of real income growth, as relevant to the explanation of increased conflict. These factors, combined with the effects of a strong government commitment to full employment (on the one hand in tempering union concern over the employment consequences of their actions, and on the other in promoting employer willingness to grant concessions), are then seen as contributing to escalating wage inflation.

On a more solidly empirical level, evidence has been advanced by a number of authors in support of a chain of reasoning which posits a line of causality from distributional conflict to increased industrial unrest and greater militancy, and then to escalating wage settlements. In terms of the first link in the chain, implicit support for the essentially sociological character of recent upsurges in conflict is derived - at least in the British context - from the breakdown of conventional strike models (Hunter, 1973; Shorey, 1974), as well as from the simultaneous occurrence of such social conflicts as student unrest (Harrod, 1972).

In terms of the second link in the chain, namely that between industrial conflict and wage inflation, Hines (1964, 1969, 1971), in a now famous series of articles, has amassed a considerable amount of evidence in support of a significant positive relationship between the rate of change of union membership, used as an index of trade union militancy, and the rate of change of money wages in the United Kingdom. At the same time this work has demonstrated the absence of any significant relationship between wage changes and unemployment.This is interpreted as <u>prima facie</u> evidence that trade unions are able to exert upward pressure on wages independent of the state of the labour market. Similar conclusions have also emerged from the work of Godfrey (1971), who, while rejecting Hines' choice of a union membership-based index of militancy, has reported a significant positive relationship between money wage changes and strike frequency in the UK over the period 1956-1969, while once again confirming the apparent irrelevance of unemployment. Further confirmation of these findings has also been presented by Taylor (1972).

In an international context, Ashenfelter, Johnson and Pencavel (1970) have provided empirical support for a significant positive relationship between changes in money wage rates and both the rate of change of union membership and strike activity using US data; while Sylos-Labini (1974) in Italy, and Swidinsky (1972) in Canada, have similarly reported significant positive coefficients on a strike variable in money wage equations. Finally, in a comparative study of the performance of 'unionized' Phillips curves in seven industrialized economies, Thomas (1977) found support for the hypothesis that increasing unionization has affected both the position and slope of the Phillips curve to varying degrees in the United Kingdom, Japan, Austria, Norway, Denmark and Sweden.[3]

These studies are not without their detractors, however. Indeed, most studies providing empirical support for a trade union militancy role in inflation can be matched at least one-to-one by those reporting negative findings. Hines' work in particular has been subject to extensive criticism by a number of authors. These include: Thomas and Stoney (1970), who have highlighted specification problems; Burrows and Hitiris (1970) and Godfrey (1971), who have questioned the consistency of union membership as a proxy for militancy; and Purdy and Zis (1974), who have waged a crusade on both empirical and theoretical grounds against the use of the change in unionization variable; finally, on an internacional level, Ward and Zis (1974) have found the variable to be insignificant in the Netherlands and incorrectly signed in Germany.

In the context of the use of strike variables, Johnson and Timbrell (1973), in one of the few tests of a bargaining theory of wage determination,[4] report no significant relationship between wage inflation and contemporaneous strike activity in Britain over the period 1959-1971. In addition, on a comparative basis, Ward and Zis (1974) report largely negative findings for the UK, Belgium, the Netherlands, France, Italy and Germany over the period 1956-1971 using Phillips curves including a price expectation variable, and supplemented with several alternative measures of strikes.[5] Of these alternative measures, only contemporaneous strike frequency[6] appears to have any general significance, and even this is not significant in all the countries sampled, leading Ward and Zis to conclude that trade union militancy, as proxied by strikes, appears relevant only to the wage inflation experience of Italy and possibly, though to a somewhat more ambiguous extent, also of France.[7]

In addition to these empirical criticisms of the significance of strike based militancy indices, objections have also been raised on a theoretical level. Thus it is argued that even where a significant positive relationship is established between strikes and wage inflation, it does not follow that this necessarily derives from a causal link running from the former variable to the latter, since in practice the direction of causality could also run the other way. This highlights the major difficulty with all cost-push explanations; namely, that of unambiguously attributing causality in the absence of any well-developed theoretical framework for analysing the microeconomics of union employer bargaining relationships, and hence by implication, of the behavioural mechanics of cost-push inflation. In view of this, cost-push analyses have proved highly vulnerable to attack from the rival - and theoret-

ically more secure - excess demand school; partly because of their theoretical inadequacies, but also because of their apparent inability to account for the international character of inflation and industrial unrest.

II. The International Monetarist Explanation of Inflation and Industrial Conflict

Proponents of the 'international monetarist'[8] variant of the excess demand approach argue that to be convincing a potential explanation of inflation must be broadly consistent with at least five important aspects of recent international inflationary experience. First, it must explain its chronic nature, or more particularly, the fact that inflation rates have been positive in all member nations of the Group of Ten since 1956, and have generally been getting progressively worse. Second, a satisfactory explanation must account for the simultaneous acceleration of rates of wage increase across countries since the mid-1960s. Thus, while their precise timing varies from country to country, accelerations are evident in all member nations of the Group of Ten from the late 1960s and into the 1970s. Third, some explanation must be given for the broad similarity in inflation rates in different countries during the 1960s,[9] and their divergence since 1972.[10] Fourth, a satisfactory account must be given for the persistence of higher rates of inflation in recent years, even in the face of growing unemployment; in short, for the apparent break-down of the Phillips relationship. Finally, the explanation must also be consistent with the emergence in the late 1960s of industrial unrest of a type and intensity out of step with recent historical experience.

Part of the rationale behind the construction of these requirements is, of course, to demonstrate the inadequacy of country-specific cost-push views of inflation, and by implication, also the inadequacy of country-specific 'sociological' explanations of the recent international escalations in aggregate strike activity. Thus, the international monetarist explanation strongly emphasizes that single-country cost-push approaches are totally unable to account convincingly for either the simultaneous escalation in strikes and inflation at the international level, or for the observed similarity of inflation rates across countries. Indeed, even if evidence could be adduced for some form of international demonstration effect linking industrial confict both across countries and with the simultaneous acceleration of inflation rates - the events of May/June 1968 in France, the Hot Autumn of 1969 in Italy, the rank and file militancy in Germany and Sweden, for example - a cost-push account would still fall foul of the need to explain why the accelerations were all of a broadly similar magnitude (Zis, 1975).

In contrast to the inadequacies of the cost-push explanation, an international monetarist analysis is able to perform adequately on all counts. The basic monetarist argument is that the level of domestic wage inflation is ultimately determined by the level of excess demand prevailing in the labour market. At a national level this will depend largely on the monetary policies pursued by domestic governments, and in particular on the pace of domestic monetary expansion relative to the growth of real output. At an international level, however, under a system of fixed exchange rates, and where there is considerable interdependence through free trade, the

domestic monetary authorities of smaller open economies are seen to lose a significant degree of control over their domestic money supplies. The argument supporting this contention is easily stated. Suppose a small country, heavily involved in international trade and inflating at the 'world rate', decides to reduce its domestic money supply in an attempt to bring its rate of inflation down below the world level. In the first instance, the impact of such a move would be to reduce domestic aggregate demand, and thereby reduce the demand for both domestically produced goods and imports. One consequence of this (assuming an initial position of external balance), would be the emergence of a surplus on international trading account, which would be further enhanced as declines in the demand for domestically produced goods led to moderation in the rate of change of both domestic wages and prices, and further increaes in international competitiveness. The emergence of this balance of payments surplus would then imply an excess foreign demand for the domestic currency, and associated upward pressure on its external value. Since, under a system of fixed exchange rates, currency appreciation would be largely ruled out, the domestic monetary authorities would be left with little choice but to enter the foreign exchange market in order to purchase the excess supply of foreign currency. Through this action the domestic money supply would once again be increased, pushing the domestic inflation rate back toward the world level.

Applying this analysis to the inflationary experience of the Group of Ten, it is argued that following the post-war agreement at Bretton Woods, member nations effectively operated a system of broadly fixed exchange rates

until 1971. Also during the period, their interdependence was reinforced both by the rapid reduction in tariffs under the auspices of G.A.T.T., and the formation of the Common Market, as well as by the dramatic growth of the Eurodollar market. These developments are seen as having had three major consequences. First, national economies became linked to form, in effect, a world market in both manufactured goods and a number of primary commodities. Second, prices came to be effectively determined on a world rather than a national basis. Third, domestic inflation rates became tied to a world rate, determined by the growth of the world money supply.

Within this 'world' system, since all member nations, with one exception, broadly fit the description of 'small open economies with fixed exchange rates', it is suggested that none was in a position to affect appreciably the world money supply by unilateral action. The one exception, of course, is the United States, whose role in the system is seen as exceptional for two reasons. First, its significant size relative to the world economy has meant that its domestic monetary policies have been able to exert a significant influence over the course of world money supply. Second, and of crucial significance, the dollar has functioned as a major reserve currency - a currency, that is, which other countries are prepared to hold as a cushion against fluctuations in their external balance. This has historically placed the United States under much less pressure than non-reserve currency countries to correct its balance of payments deficits.

This exceptionalism is seen as giving the United States a key role in the international emergence of inflation. It is argued that during the 1950s, as

the demand for reserve assets grew along with the rapid expansion in world trade, US dollars were willingly held as a substitute for gold into which they were, in any event, potentially convertible. This allowed the United States to run balance of payments deficits with relative impunity; although during this period the United States Government was generally concerned to follow a fairly cautions monetary policy, a fact which ensured a moderate rate of world money supply growth, and hence a moderate rate of world inflation.

In the early 1960s, the situation changed as increased emphasis was placed by the US authorities on the task of reducing the level of domestic unemployment. As Table 4.1 illustrates, the annual average rate of monetary expansion over the period 1961 to 1964 was more than twice that for 1957 to 1960. The situation was further intensified after 1965 as the United States sought to finance both its increasing involvement in the Vietnam War, and a variety of domestic social programmes, by means of money supply expansion rather than increased taxation. One consequence of this policy stance was the progressive deterioration of the United States' external payments position - a deterioration which, it is argued, other countries were now only prepared to countenance in view of their fears for the stability of the world monetary system.

Table 4.1 Annual Average Rates of Growth of Money Supply 1957-1972

	1957-60	1961-64	1965-68	1969-72
U.S.A.	3.2	6.6	8.3	9.4
Group of Ten	5.1	9.4	9.9	13.9

Source: Zis (1975), p. 115

These events are taken to account, in large measure, for the growth of world money supply until 1968. In terms of post 1968 experience, it is emphasized that while the United States is the only country capable of exerting a significant unilateral influence on the system, the overall world money supply is still fundamentally dependent upon the collective thrust of the monetary policies pursued by other countries. Thus, the moderate increase in money supply growth over the period 1965-1968 (from 9.4 to 9.9 per cent) illustrated in Table 4.1, is seen as due to the cautious monetary policies pursued by other members of the Group of Ten.[11] After 1969, however, this collective caution was rapidly dissipated as several other members of the Group pursued expansionary monetary policies predicated either on a desire to reduce balance of payments surpluses (Zis, 1975, p. 117), or in pursuit of the objective of maximum domestic expansion consistent with external balance[12] (Soskice 1978, p. 229). As a result, for the period 1969-1972 the acceleration in world monetary expansion to 13.9 percent derived largely from the pclicies pursued by countries other than the United States, whose money supply growth had, in fact, dropped back to only 4.3% by 1970 (Zis, 1975).

To summarize, on the basis of the above analysis it is argued that the simultaneous acceleration in rates of wage inflation among the Group of Ten in the mid-1960s may be traced initially to the overheating of the American economy. The similarity in levels of inflation is then seen to derive from these countries' collective subjection to world money supply as a result of a common commitment to fixed exchange rates within a closely integrated world economy. When this fixed exchange rate system came to an end in August 1971, however, individual countries regained the ability to pursue divergent monetary policies - a development which, according to the monetarists, accounts for the emergence of significantly different rates of inflation among the members of the Group of Ten since 1972.

The last element in the monetarist argument is the explanation of the observed coexistence of higher rates of wage inflation together with rising unemployment (i.e. the apparent breakdown of the Phillips curve), and the simultaneous emergence of industrial unrest. With respect to the former, it is argued that while excess demand generated by an expansionary monetary policy is the main source of inflationary pressure, as inflation emerges, both trade unions and firms will seek to bargain over money wage increases which incorporate their expectations concerning future rates of price increase. Thus, the actual rate of wage inflation ($\dot{W}_t$) will be determined by excess demand (X_t) (both domestic and international), and the expected rate of price inflation ($\dot{P}_t^e$). Formally:

$$\dot{W}_t = f(X_t, \dot{P}_t^e),$$

where substitution of the unemployment rate, U_t, for X_t, gives an expecta-

tions-augmented Phillips curve. This construct is clearly consistent with the coexistence of rising unemployment and accelerating inflation, since at any given level of unemployment the rate of wage inflation could be shifted upward by an increase in price expectations.

As far as the emergence of industrial unrest is concerned, it is argued that only if the actual rate of inflation is correctly anticipated will real incomes rise in line with expectations. In periods of rising inflation, however, this state of affairs is unlikely, with the consequence that income earners will find their real incomes being eroded by increasing prices at a rate faster than anticipated. The predicted result is progressive attempts to recoup real income increases denied by inflation, the consequent emergence of catch-up claims and union demands for cost-of-living allowances, and an inevitable escalation in the level of industrial unrest.

On the basis of the monetarist analysis, therefore, strikes and industrial unrest are seen as a consequence of world-wide inflation, rather than as a cause. Their analysis is thus based upon an implicit model of strike determination which includes the expected rate of inflation as one of its key variables. Formally, this may be expressed in terms of either prices or real wages. Specifically in terms of the latter variable, this may be expressed as follows:

$$S_t = a_0 + a_1(\Delta R_t' - \Delta R_t^e) \text{ with } a_1 < 0 \qquad (1)$$

where S_t is an index of strike activity; $\Delta R_t'$ is the actual rate of real wage growth over recent periods; and ΔR_t^e its expected rate, so that $\Delta R_t' - \Delta R_t^e$ indicates the extent to which real wage expectations are

actually realized. However, since ΔR^e_t is unobservable, some assumptions are necessary concerning how expectations are actually formed. In practice, this is a contentious issue, although a common assumption is that long-run expectations are formed as the weighted sum of a constant long-run increase parameter (T), and a finite moving average of previous real wage changes. Formally:

$$\Delta R^e_t = (1 - \Psi)T + \Psi \sum_{i=1}^{n} \Phi_i \Delta R_{t-i} \quad \ldots \quad (2)$$

$$\text{with } \sum \Phi i = 1 \text{ and } 0 < \Psi < 1.$$

Now, since recent actual changes are given by:

$$\Delta R'_t = \sum_{i=1}^{m} \alpha_i \Delta R_{t-i} \quad \ldots \quad (3)$$

$$\text{with } \sum \alpha i = 1.$$

Substitution into (1) gives:

$$S_t = a_0 + a_1 \left[\sum_{i=1}^{m} \alpha_i \Delta R_{t-i} - \{(1 - \Psi)T + \Psi \sum_{i=1}^{n} \alpha_i \Delta R_{t-i}\} \right] \quad (4)$$

This in turn reduces to:

$$S_t = a'_0 + a'_1 \sum_{i=1}^{L} \mu_i \Delta R_{t-i} \quad \ldots \quad (5)$$

$$\text{with } a'_0 = a_0 - a_1(1 - \Psi)T$$

$$\text{and } \mu_i = (\alpha_i - \Psi\Phi_i).$$

The latter real wage formulation is, in fact, identical to the expectations-achievement gap formulation originally postulated by Ashenfelter and

Johnson, and subsequently employed by Pencavel, Hunter, Hibbs and Snyder using an Almon lag estimating technique.

This clearly has important implications in the present context. First, it suggests that Ashenfelter and Johnson's model is broadly consistent with the international monetarist analysis, and thus constitutes a potential test of one of its key elements: namely, its explanation of industrial conflict. This in turn brings us back to the results presented in Chapters 2 and 3. As we have seen, while the reported findings of Ashenfelter and Johnson (USA, 1952-1967), Pencavel (UK, 1950-1967), Smith (Canada, 1953-1968) and Hibbs (Belgium, Canada, France, Italy, Japan, the Netherlands, Norway, Sweden, UK and USA, 1950-1969), all confirm the empirical significance of the expectations-achievement gap construct in explaining variations in strike action over time,[13] doubts have been raised about its ability to account for the extent of the escalations in strike frequency occurring in Britain after 1967 (Hunter, 1973); and for its relevance in France and Italy (Snyder, 1975).

An alternative implication is that if the monetarist analysis can, in fact, be shown to be broadly correct for all members of the Group of Ten (i.e. Belgium, Canada, France, Italy, Germany, Japan, the Netherlands, Sweden, UK and USA), then Snyder's contention that economic factors are largely irrelevant to the process of strike determination in 'non-institutionalized' systems such as those of France and Italy is untenable.[14] Further, contrary to Shorter and Tilly's contention, it also implies a continuing role for economic factors in determining strike frequency in Belgium, Germany, the Netherlands and Sweden, where 'labour's entry into the polity' had supposedly insulated

the strike from the effects of economic factors. Evidently, therefore, a considerable amount hinges upon the overall validity of the international monetarist explanation.

III. The International Monetarist Argument: An Assessment

While the logic of the international monetarist argument is certainly compelling, it is not without its detractors. In particular, it has been suggested that on a number of points its validity rests on a fairly casual form of empiricism. Complete acceptance must therefore depend upon its passing somewhat more rigorous empirical tests. Strictly, this should involve detailed empirical verification of each of its four principle components: first, the theory of domestic inflation embodied in the expectations Phillips curve:

$$\dot{W}_t = a(U_t, \dot{p}^e_t) \qquad (1)$$

$$\text{with } a^1 < 0;\ a^2 > 0.$$

Second, the assumed theory of price expectations:

$$\dot{p}^e_t = (1 - \psi) \sum_{n=1}^{\alpha} \Psi^{n-1} p_{t-n} \ldots \qquad (2)$$

Third, the possibility of the emergence of unanticipated inflation leading to attempts to realize frustrated real income increases, and the consequent emergence of industrial unrest:

$$S_t = a(\dot{p}_t - (1 - \Psi \sum_{n=1}^{\alpha} \Psi^{n-1} \dot{p}_{t-n}) \ldots \qquad (3)$$

$$\text{with } a > 0.$$

And finally, the validity of the hypothesized 'international transmission mechanism' linking domestic excess demand - for which unemployment is considered a satisfactory proxy - to the world money supply.

In practice, of course, this chain of reasoning is only as strong as its weakest link. For example, if it could be demonstrated that the expected rate of inflation relevant to collective bargaining decisions is determined on the basis of rational expectations (i.e. the rate that would be predicted by a forecaster employing an econometric model of the economy), rather than on the basis of adaptive expectations as in equation (2), then the notion that observed escalations in strikes could be attributed to the emergence of unanticipated inflation would clearly be undermined. Given the current state of knowledge about expectations and their formation, as well as the absence of objective expectations data, however, this is not a particularly fruitful avenue of criticism of the monetarist argument. Consequently, detailed attention in this section will be concentrated on the first and third components of the argument outlined above: namely, the domestic theory of inflation and the implied theory of strikes. Consideration of the remaining component - the validity of the hypothesized international transmission mechanism - is more conveniently postponed until the next section.

With regard to the domestic theory of inflation, an expectations-augmented Phillips curve was fitted to annual wage inflation data[15] for the member nations of the Group of Ten over the period 1952-1977. The fitted model was of the general form:

$$\dot{W}_t = a_0 + a_1 U_t^{-1} + a_2 \dot{p}_{t-1/2} + E_t .$$

This equation relies on a much simpler, but still plausible, price expectations specification; namely, that current expectations are formed on the basis of the annual rate of price inflation experienced over the preceding six months.[16] In addition, in two countries, namely France and Japan, unfilled vacancies are substituted as a more reliable proxy for labour market excess demand.[17] The results are presented in Tables 4.2 and 4.3.

Generally, satisfactory results are obtained in eight out of the ten countries - namely, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands and the United States - with both labour market and price coefficients significant and correctly signed in all cases - although in Belgium, Italy and the Netherlands the price coefficients do appear implausibly high.[18] However, as Table 4.3 illustrates, significant prediction errors are evident in several cases over the period 1968 to 1974, the period during which the major wage acceleration occurred. In particular, the model significantly underpredicts the escalations in wage inflation occurring in Belgium in 1970 and 1972-73; in Canada in 1968, 1971 and 1974; in France[19] in 1974; in Germany in 1970 and 1973-74; in the Netherlands in 1971; and in the United States in 1968 and 1971. In two cases these underpredictions are particulary acute: in Italy in 1970 and 1973; and in Japan in 1974.

The results are least satisfactory for Sweden[20] and the United Kingdom. In the former case the coefficient on the unemployment rate is insignificant, and serious underpredictions are recorded in 1970, 1972 and 1976. In the case

of the United Kingdom, a significant positive relationship is established between wage changes and unemployment,[21] and serious underpredictions are recorded in 1970 and 1973.

Table 4.2 Expectations Phillips Curve Regression Results, Ten Countries

Country	Period	a_0	U_t^{-1}	$P_{t-1/2}$	R^2	D.W.
Belgium	1953-1974	-1.019 (-0.522)	401.19 (2.555)	1.678 (7.355)	0.904	1.63
Canada	1952-1975	8.50 (1.254)	1283.6 (3.205)	0.359 (3.048)	0.768	1.78
France[1]	1956-1967 1969-1976	3.66 (3.721)	0.0352† (4.726)	0.585 (4.010)	0.831	2.09
Germany	1953-1975	3.348 (2.302)	927.0 (3.501)	0.562 (2.106)	0.613	2.04
Italy	1956-1975	-2.83 (-0.735)	5311.03 (1.808)	1.235 (4.895)	0.745	2.00
Japan	1956-1975	-4.73 (-2.54)	0.0373† (6.713)	0.478 (3.806)	0.854	2.00
Netherlands	1954-1975	0.0116 (0.009)	210.04 (4.71)	1.133 (7.47)	0.650	2.15
Sweden	1953-1977	6.751 (3.64)	18.18* (0.594)	0.309≠ (4.456)	0.389	2.06
U.S.	1953-1974	3.82 (1.615)	1367.5 (6.143)	0.220 (1.970)	0.834	2.05
U.K.	1952-1975	7.372 (3.758)	-1242.9 (-2.208)	0.642 (5.29)	0.788	1.72

Data Source: OECD Main Economic Indicators [1]excluding 1968 † unfilled vacancies
* inverse of unemployment rate ≠ export prices

Table 4.3 Prediction Errors for Expectations Phillips Curve Regressions, Ten Countries, 1968-1974

Country	1968	1969	1970	1971	1972	1973	1974
Belgium	-1.3	0.1	0.9	0.1	2.2	1.3	0.0
Canada	2.2	-0.6	-0.1	1.9	-0.5	-2.5	2.3
France	-	-	-0.2	-0.1	-1.6	-1.6	2.6
Germany	-1.6	0.9	2.5	-1.5	-1.1	0.9	1.5
Italy	-3.8	0.2	11.2	0.4	-1.1	9.1	-3.7
Japan	-0.5	0.4	1.3	0.3	-0.9	-2.1	6.6
Netherlands	0.2	0.8	0.5	2.5	-0.6	0.0	-0.8
Sweden	-0.5	-0.2	3.2	-0.8	6.4	0.4	-4.0
U.S.A.	1.6	-0.8	0.4	1.5	0.6	-0.3	0.6
U.K.	-0.6	1.2	4.2	-1.1	3.8	-1.6	1.1

Source: Equations estimated in Table 4.2

While these results are significantly more favourable to the basic excess demand expectations model than several previous international comparative studies (Nordhaus, 1972; Perry, 1975),[22] they nevertheless still cast some doubt over its adequacy as the sole explanation of recent escalations in wage inflation, particularly in the cases of Sweden, the United Kingdom, Italy and Japan.

Scepticism about the adequacy of the international monetarist explanation is further reinforced when its implied theory of strikes is exposed to critical scrutiny. In particular, acceptance of the monetarist thesis that

the recent strike waves were the product of the union's response to the emergence of unanticipated inflation requires that two conditions must be met (Soskice, 1978). First, that increases in price inflation predated the escalations in strikes; and second, given that the latter were unprecedentedly large by post-war standards, that the increases in price inflation were also substantial. As Table 4.4 indicates, however, with the notable exception of Japan, where developments were broadly simultaneous, the major escalations in strikes actually predated those in price inflation.

To summarise, it is clear that the major positive feature of the monetarist argument, namely its ability to explain both the simultaneous emergence of industrial unrest across countries, and the simultaneous acceleration of unprecedentedly high rates of wage inflation, is negated by its empirical weakness.Moreover, as Soskice (1978) has argued, the monetarist analysis is also unable to account for a further important feature of the strike waves; namely, the precise form that they took. In particular, it provides no clue as to why in Europe the origins of worker protest were based firmly at plant level rather than in the more centralized structures of trade unionism; or why the protest was in several important instances out of step with recent historical experience in being largely unofficial. This feature was particularly evident in Sweden, Germany, Belgium and the Netherlands.

These weaknesses in the monetarist explanation have prompted the construction of an alternative international explanation of recent wage-strike experience, representing, in effect, a 'cost-push' counter-attack.

Table 4.4 Initial Timing of Major Escalations in Prices and Strike Activity: Ten Countries

Country	Prices	Strikes	
		Frequency	Volume
Belgium	1972-73	1969-72	1970-72
Canada	1973-74	1965 (gradual) 1974	1966-69
France	1969; 1974	1968-71	1967-68
Germany	1971	N/A	1971
Italy	1973-74	1968-71	1969
Japan	1970-74	1970-74	1971
Netherlands	1969*; 1971-75	1969-70	1970-73
Sweden	1970-71	1968-70	1971
U.K	1971; 1974-75	1968-70	1970-72
U.S.A.	1964 (gradual) 1973-74	1968-70	1967; 1970

Source: O.E.C.D. Main Economic Indicators

Notes: * = Value-added tax increase
N/A = not available

IV. International Strike and Wage Experience: An Alternative Explanation

The key element in the "internationalization" of the monetarist theory is the specification of an 'international transmission mechanism' linking domestic excess demand to the world money supply. The theoretical foundations of this mechanism are to be found in recent contributions to the monetary theory of the balance of payments (Mundell, 1971; Johnson, 1972; Parkin, 1972; Laidler and Nobay, 1974), while its practical manifestations are traced, as we have seen, to mounting US balance of payments deficits in the late 1960s and early 1970s. As with the other elements of the monetarist approach, however, this mechanism has not escaped criticism. Soskice (1978), for example, has pointed to two weaknesses. The first is the theoretical problem that even under fixed exchange rates domestic monetary authorities still retain some control over domestic money supply, and can move to neutralize or sterilize money inflows. The second is the empirical problem that the USA only came to run large balance of payments deficits against most European countries after 1969/70, which is, as Table 4.4 indicates, too late for it to account successfully in any general way for the strike waves, or for the wage explosions which occurred more or less simultaneously.

The monetary channel of international transmission is not, however, the only potential mechanism linking domestic economies. Salent (1977), for example, has isolated four such mechanisms.[23] Thus, inflation, and hence the potential for conflict, may also be transmitted via the direct effect of foreign price changes, as under the so-called Scandinavian model (Aukrust, 1970; Edgren, Faxén and Odner, 1969); or via changes in autonomous expenditure

- and in particular the balance of exports over imports as in the Keynesian model. In both cases, however, the theory is contradicted by empirical evidence. Thus, the Keynesian mechanism is subject to the same criticisms as the monetarist mechanism, since both rely on the effects of the US external deficit; while the Scandinavian theory is effectively contradicted by the work of Perry (1975), who finds no evidence for any unusual increase in price inflation preceding the wage explosions in Group of Ten countries, and hence, by implication, little scope for the international transmission of industrial conflict via direct price effects.

The fourth potential mechanism of transmission is the direct international linkage of wages (and strikes), either as a result of competition between international labour markets, or as a result of international trade union cooperation. However, while specific examples may be found for both of these linkages,[24] they do not really constitute a sufficiently extensive, a sufficiently consistent, or a sufficiently sustained mechanism of transmission across all ten countries. The mechanism is, in fact, simply an elaborated re-statement of the cost-push analysis presented earlier. In practice, therefore, there are important question marks against each of these transmission mechanisms as the sole source of the international character of the strike waves and wage explosions of the late 1960s.

It is, however, important to emphasize that neither the simultaneous escalation in strikes, nor that in wages, need necessarily rely on the existence of a mechanism of international transmission. These developments could also be due to factors such as common institutional and structural changes

across countries, or to common economic policy responses by national governments to common economic problems (Salent, 1977). In terms of common institutional changes, attention might obviously be drawn to the increasingly interventionist role of the state as employer, consumer, fiscal authority, supplier of public goods and services, and formulator of economic policy.[25] Moreover, intimately related to this increased state involvement has been the emergence of a substantialy reduced tolerance of unemployment, and a concomitant willingness by governments in a number of countries to use both monetary and fiscal policy to run the domestic economy at levels that are much closer to their full-employment potential.[26] This has inevitably made these economies more vulnerable to inflationary shocks. It has also had at least two other important consequences. First, insofar as bargaining power derives from the state of the labour market, full employment policies have been instrumental in increasing that power at plant level (Phelps-Brown, 1971; Marris, 1972). This, in turn, has undoubtedly helped facilitate the significant secular shifts that have taken place in virtually every European member of the Group of Ten toward increased decentralization in wage determination and collective bargaining (Schregle, 1974).

Second, as Lehmbruch (1977) has argued, three decades of increasing state economic intervention have come to condition public expectations in a way that has led to policy makers being held increasingly responsible for the simultaneous achievement of a variety of economic goals, including full employment, stable prices, external balance and rapid growth. As many governments have discovered to their cost, this loss of the quasi-natural justification for

market forces has emerged at broadly the same time as increasingly severe limitations have been placed upon domestic policy makers by international developments[27] which have made "both many targets and several policy instruments less susceptible to domestic national manipulation than earlier" (Lindbeck, 1975, p. 36). One consequence has been the emergence of what has been referred to as economic 'control deficits' (Lehmbruch, 1977), as a result of which governments have "increasingly turned to more direct attempts at influencing the economic behaviour of business and/or labour . . . by 'moral suasion', or by more or less 'dirigiste' measures, especially 'incomes policies'" (Lehmbruch, p. 98). Indeed, it is these incomes policies which have formed a core element in the area of common policy responses to common economic policy problems, and as such they have constituted an important potential linkage in the economic experience of different countries.

It is the latter notion which forms the basis of the argument advanced by Soskice (1978) in his attempt to provide a satisfactory explanation for the strike waves and wage explosions that occurred in France, Italy, Germany and the United Kingdom between 1968 and 1970. The starting point for this analysis, like that of the monetarists, is the behaviour of world money supply. However, rather than placing primary emphasis on the effects of the US monetary expansion of the late 1960s, Soskice directs attention toward the cautious policies pursued by the United States during the late 1950s and early 1960s. These policies, together with their restraining influence on world money supply and world prices, are seen as having provided an important constraint on the European boom that emerged following the economic downturn of

1958. In particular, it is argued that strengthening cost-push pressures in Europe in the early 1960s, combined with unusually strong competition in international markets and the moderate growth of world prices, conspired to create both balance of payments difficulties and a significant squeeze on profits. Thus, between 1963 and 1966 balance of payments deficits appeared in Italy (1963), France (1964-65), Sweden (1964), Germany (1965-66), and the United Kingdom (1964, 1966); while from the mid to the late 1960s, the share of profits in national income declined in all member nations of the Group of Ten, except the United States and Canada.

Given their commitment to fixed exchange rates, the response of European governments to these events was almost universally the same; namely, the introduction of restrictive monetary and fiscal policies, and the introduction or re-introduction of some form of wage/price policy.[28] The response by employers was also broadly similar across countries. In particular, it is argued that from the mid to late 1960s, employers moved to take advantage of the ensuing recession - and in particular the higher levels of unemployment - either to change inflationary plant level payments systems (as in the United Kingdom),[29] to reduce plant level wage supplements (as in Germany), to achieve a general rationalization of business structure and work practices (as in France), or to make improvements in productivity performance via increases in the pace of work (as in Italy). According to Soskice's argument, however, the exact form that these responses took depended crucially on the prevailing institutional environment.

As Soskice goes on to argue, these policies began to have their major effect just at a time when US domestic policies became more expansionary. The result of the latter development was an increase in both the US and world inflation rates from the mid-1960s, a state of affairs which, it is argued, allowed European employers to seek to translate cost reductions into higher profit margins,[30] rather than lower prices, at a time when real wages were being eroded both by moderation under national wage restraint policies, and erosion due to escalating world prices.

These events, in providing the background to the strike waves of the late 1960s, are seen as suggesting a number of important 'frustration' factors as relevant to an international explanation of strikes and wage inflation. First, increased employer pressure at shop floor level exercised during periods of labour market slack in the face of declining profitability. Second, the subsequent recovery of corporate profits at a time when real wages were being eroded by increasing world prices. And third the imposition at the national level of some form of income or wage restraint policy, often accompanied by restrictive fiscal and monetary policies.[31] However, Soskice also emphasises a fourth point: namely, that national unions were in many instances either co-opted or tied into long-term agreements they could not re-negotiate. This, together with the fact that employer rationalization policies were carried on at plant level where national unions were either weak or lacked authority over their memberships (Soskice, p. 221), is argued to account for the predominantly unofficial nature of the observed protest. Finally, on the basis of this analysis, it is emphasized that the broadly

simultaneous acceleration in wage settlements is to be seen as an essentially cost-push phenomenon, reflecting not only a perceived need by employers to compensate for the above frustration factors, but perhaps more importantly, also an attempt by employers to "buy off" a form of unofficial protest that threatened to undermine the established channels of collective bargaining.

To summarize, Soskice's analysis seeks to emphasize the importance of domestic cost-push elements as important to an understanding of recent wage and strike experience, while at the same time providing an explanation that is broadly consistent with the fundamentally international character of the problem. The result is both a highly plausible, and a significantly more complex explanation of comparative strike and wage activity, based upon broadly similar behavioural responses to similar economic experiences by governments, employers, unions, and their members across institutionally diverse industrial relations systems.

Despite their intuitive plausibility, in the final analysis acceptance or rejection of these hypotheses must be based upon considerably more rigorous specification and testing than Soskice provides. Moreover, in addition to the four European nations included in his study, other members of the Group of Ten - namely, Belgium, the Netherlands, Sweden and Japan, as well as the United States and Canada - all experienced significant escalations in wages and strike activity in the late 1960s and early 1970s. To be fully convincing, Soskice's hypotheses must also be broadly consistent with developments in these countries.

Conclusions

The main purpose of this chapter has been to broaden the scope of the analysis of strikes to include the process of wage inflation. To this end, particular attention has been given to two historico-analytic accounts of recent international wage-strike experience, the main elements of which are summarised in Figure 4.1. While both accounts, the monetarist as well as that of Soskice, are capable of providing plausible and logically consistent accounts of observed events, neither can be accepted as it stands.

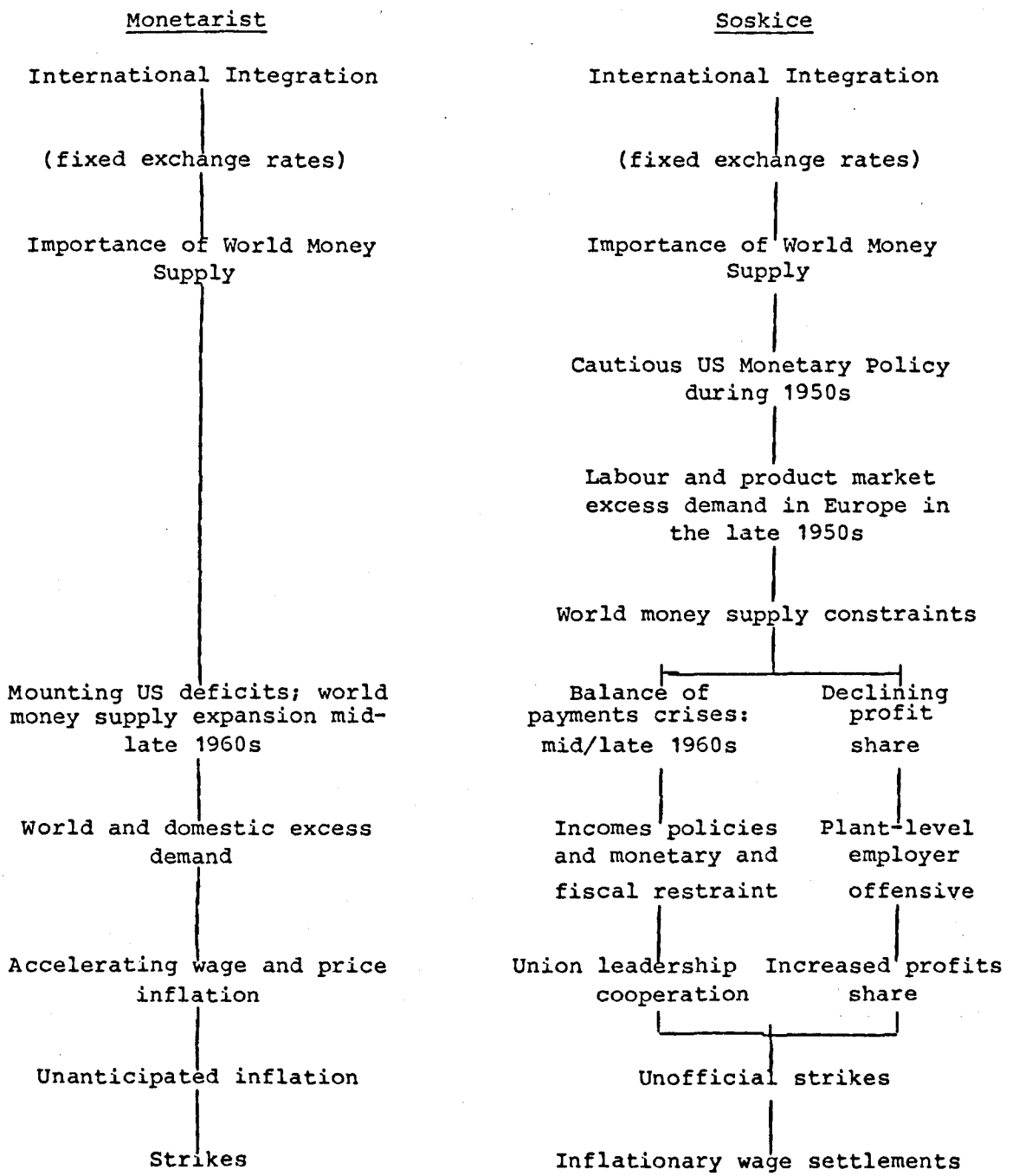
In the case of the monetarist analysis, these reservations stem from significant empirical weaknesses relating to three of its key components: its theory of strikes; its theory of domestic wage inflation; and its explanation of the international transmission mechanism. In the case of Soskice's analysis, on the other hand, these reservations stem not from demonstrated empirical weaknesses, but rather from the absence of any formal specification or rigorous statistical tests of either his implied 'frustration' theory of strikes, or his theory of wage inflation. In addition, his analysis concentrates on only four member nations of the Group of Ten.

All of these issues will be addressed in greater detail in Chapters 5, 6, and 7 in connection with the contruction, specification and testing of a formal model of comparative wage and strike behaviour. Before proceeding to this task, it is important to emphasize one conclusion that emerges forcefully from both the monetarist analysis and that of Soskice; namely, that the recent international escalations in strikes have been a primarily economic phenomenon,[32] derived from broadly similar behavioural responses across institution-

ally diverse industrial relations systems. This is clearly in line with the findings of Hibbs (1976), but runs firmly counter to the comparative theories advanced by both Shorter and Tilly and Snyder.

Figure 4.1

Alternative Accounts of Recent Wage and Strike Explosions



Footnotes to Chapter 4

1. The expression 'a sociological explanation of inflation' is often used in a derogatory fashion by monetarist economists as implying an unsystematic, ad hoc, or atheoretical approach to the problem. A useful theoretical sociological approach actually constructed by a sociologist rather than as a straw man by an economist is provided by Goldthorpe (1979).

2. Most of these explanations may be traced back to the earlier work of Ross (1948).

3. A 'unionized Phillips curve' in Thomas' terms is one which includes additional variables in T, defined as the level of union density. This variable is not treated as a proxy for militancy, but merely as reflecting the extent to which the labour force is unionized. This is then assumed to influence the wage-change unemployment relationship.

4. The bargaining theory subject to empirical tests is that developed by Johnson (1972).

5. These measures include: strike frequency; working days lost through strikes; the number of workers involved in strikes; and a 'composite' strike index based upon the work of Evans and Galambos (1966).

6. The use of contemporaneous aggregate strike frequency may be criticised on two grounds: first, the dependent variable is wage changes in manufacturing, hence manufacturing strikes is the appropriate explanatory variable; second, wage changes follow the process of negotiation with a lag, and this should be allowed for in the specification and testing of the wage equation.

7. Ward and Zis nevertheless express scepticism about the relevance of a cost push explanation even in these countries. This is based upon their observation that neither the events of May 1968 in France nor those of the 'Hot Autumn' of 1969 in Italy led to acceleration in price inflation vis à vis the rest of the world.

8. These include: Mundell (1971); Johnson (1972); Parkin (1972); Laidler and Nobay (1974) and Zis (1975).

9. Evidence on this issue is provided by Genberg (1973) and Salent (1977).

10. See for example: Trevithic and Mulvey (1975) p. 3, 8; and A.J.H. Dean (1980) p. 165. On the basis of calculations produced by the latter author the dispertion in price inflation among OECD nations varied over the period 1970-79 as follows:

1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.9	1.9	1.4	1.8	5.3	4.8	4.9	6.3	5.1	5.2

11. Many of these countries were in the process of correcting balance of payments deficits. For example, deficits appeared in Italy in 1963; France (1964-5); Sweden (1964); Germany (1965-66) and the United Kingdom (1964 and 1966). See below p. 4.29.

12. These propositions are not uncontested. See, for example Soskice (1978).

13. These studies also confirm the empirical significance of unemployment. Although the latter finding is questioned by the more recent estimations of Hunter (1973), Shorey (1977) and Knight (1972) in the U.K.

14. Clearly, even if it were argued that economic problems gave rise to both increases in union membership (via the threat effect) and precipitated political crises, which in turn caused the strike explosions, this would still imply the relevance of economic factors - albeit mediated by organisational and political considerations.

15. For data sources, see Appendix 1.

16. This assumption is equivalent to that adopted by Eckstein and Brinner (1972).

17. In the case of France, the substitution derives from the superior performance of the vacancy series. In Japan the substitution is made in the light of the fact that the operation of the permanent employment system (see Chapter 7) makes unemployment a less reliable indicator of labour market excess demand.

18. Similar observations are made by Perry (1975) p. 417.

19. 1968, the year of the strike and wage explosions, is excluded.

20. The Swedish equation employed an export price variable. See Edgren, Faxén and Odner (1969).

21. This result is highly sensitive to the period chosen for estimation. Thus, estimation over the period 1952-68 produces the expected inverse relationship with unemployment. As the estimation period is progressively extended beyond this point, however, the unemployment variable first drops from significance, and then changes sign.

22. One possible explanation for this is their estimation over a shorter and economically less stable time period.

23. Salent does, however, emphasise that in practice these mechanisms are likely to be interrelated.

24. As an example of the first linkage, competition between German and Dutch labour markets is frequently suggested as one factor in the breakdown of the Dutch wage policy in 1963 Braun (1975). As an example of the second linkage, reference might be made to co-ordinated bargaining between Canadian and U.S. branches of international unions.

25. The issue of the comparative growth in the size of the public economy and its causes is examined in detail in Cameron (1978).

26. A particularly interesting contribution in this area is provided in Hibbs (1977), in which the pursuit of macro economic policies is related to the predominant class position of the ruling party's electoral base.

27. Included amongst these, of course, are such factors as increasing international integration under fixed exchange rates, and the growth in world trade, both of which were referred to in Section III.

28. In Britain responses also included the crisis devaluation of 1967.

29. Most notable in this respect was the British car industry where there was a significant shift from the use of piece work to a system of measured day work.

30. During the mid to late 1960s the share of profits in national income increased in Belgium, France, Italy, Germany, Japan, the Netherlands and the U.K.

31. As emphasized in the context of the monetarist analysis, and as Table 4.1 illustrates, during the late 1960s members of the Group of Ten other than the U.S. were generally following cautious monetary policies.

32. A similar conclusion emerges from the recent work of Sweet and Jackson (1979).

Chapter 5

A Theoretical Model of Comparative Strike and Wage Behaviour

Economists have devoted a good deal of attention to the formulation of theoretical models of the collective bargaining process.[1] The task has not proved an easy one not least because the factors that determine the outcome of collective negotiations are so varied and complex that it is extremely difficult to devise models that are both realistic and manageable. In practice, therefore, the vast majority of researchers have found it necessary to make a series of highly restrictive assumptions about the parameters of the institutional setting. It has become common, for example, for bargaining models to abstract from the effects of uncertainty by making highly unrealistic assumptions about the information available to the various participants. Indeed, within the context of some models of strike causation the nature of these assumptions is such that the final outcome is conceptually knowable in advance, thus making recourse to strike action unnecessary and irrational.[2]

In addition, most models also find it convenient to abstract from the essentially multi-dimensional character of collective bargaining, firstly by assuming that there are only two parties to the negotiations, that is, management and unions,[3] and secondly by concentrating attention on only one aspect of the wide variety of matters at issue, namely that of wage rate determination. Finally, the approach tends to be both firmly microeconomic and apolitical in orientation, being concerned primarily with the negotiations of business unions operating at plant level. In an international context, however, where bargaining units may comprise an entire industry, region, or even the national economy; or where unions may possess macropolitical as well as microeconomic objectives, such a preoccupation is clearly inappropriate.[4]

As far as the model outlined in this chapter is concerned, a similar path of expediency is followed only to the extent of assuming that all disputes occur over wages, or over issues with easily quantifiable pecuniary implications. Apart from this initial assumption, an attempt is made to make more concessions to reality than is usual: first, by taking explicit account of the fact that collective bargaining is carried on under conditions of uncertainty, within an environment characterized by imperfect information; second, by acknowledging the existence of three distinct parties to the negotiating process - management, union leadership, and union rank and file;[5] and finally, by making allowance for the likely effects of bargaining at levels above that of the individual plant.

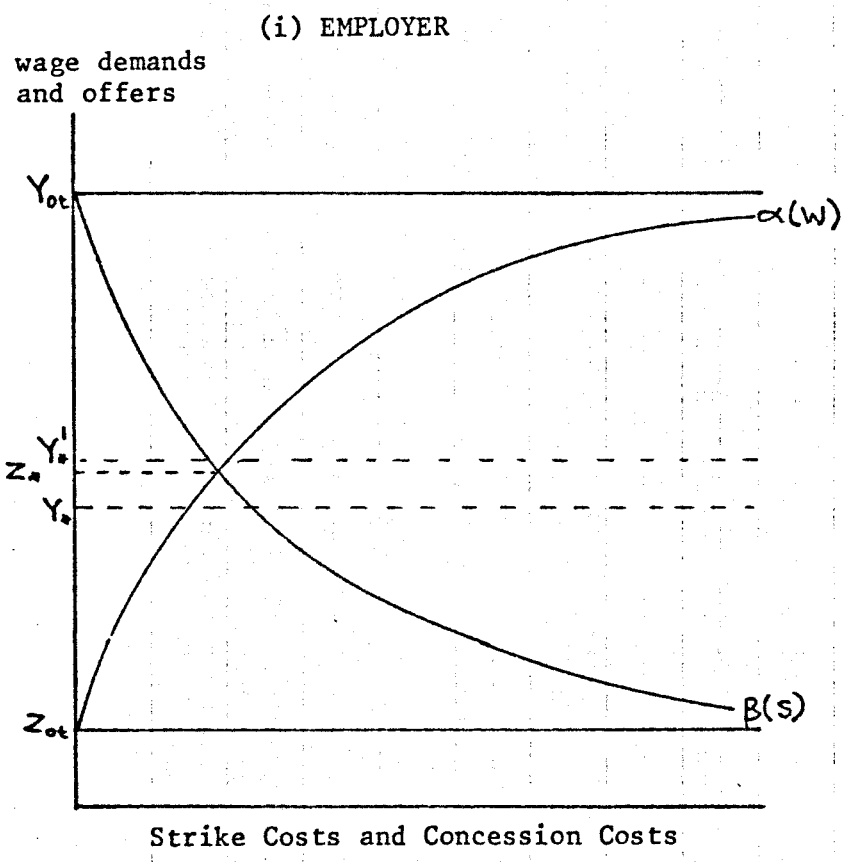
In a subsequent chapter these assumptions will be relaxed even further, as allowance is made for the effects on collective bargaining of institutional variation across countries; including the possibility of state intervention through some form of incomes policy, and the possibility that organized labour will pursue macropolitical, as well as short-term economic objectives.

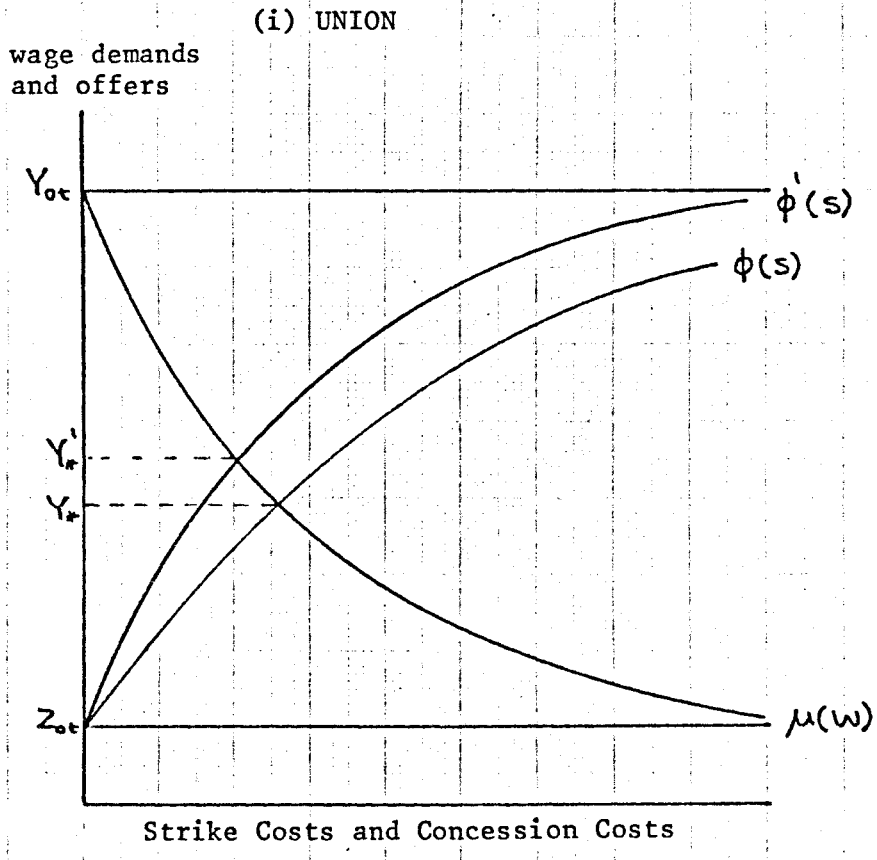
I. The Formal Model

It is assumed in the first instance that negotiations are initiated in period t by the unions submitting a wage claim Y_{ot} which is countered by an employer offer Z_{ot}. These initial demands and offers serve to convey a certain amount of information concerning the bargaining attitudes of the parties,[6] and also to delineate the range within which the final bargain can be expected to fall.

As bargaining proceeds, these initial positions will be modified, with concessions being made by both parties so long as the expected costs of such action are less than the costs of the alternative of refusing to give ground and thereby incurring a strike.[7] Figure 5.1 helps illustrate this.

FIGURE 5.I


(i) EMPLOYER
wage demands
and offers
Y_{ot}
$\alpha(w)$
Y'_*
Z_*
Y_*
$\beta(s)$
Z_{ot}
Strike Costs and Concession Costs


(i) UNION
wage demands
and offers
Y_{ot}
$\phi'(s)$
$\phi(s)$
Y'_*
Y_*
Z_{ot}
$\mu(w)$
Strike Costs and Concession Costs

Possible wage increases are plotted on the vertical axis, while subjective estimates of the costs associated with incurring a strike or conceding on the opponent's terms are plotted on the horizontal axis. In panel (i) the schedule $\alpha(W)$ represents the employer's subjective estimate of the costs of agreeing on the union's terms for all possible wage increases in excess of its initial offer Z_{ot}. These costs will be largely composed of the anticipated increase in unit labour costs associated with granting a larger wage increase than Z_{ot}. However, in addition, the employer is also likely to impute a further cost element representing his estimate of the effects on his future bargaining position of giving in to union demands during the current round of negotiations. Indeed, as Hyman (1977) has argued, "the repeated concession of a slender margin may represent, over time, the surrender of substantial ground. In political terms, the fact that one side proves its refusal to compromise beyond a specific point may exert a profound influence on subsequent negotiations."[8]

The downward-sloping schedule $\beta(S)$ in panel (i) represents the anticipated costs of resisting union demands, and reflects the employer's subjective estimate of the strike costs that must be incurred to persuade the union to accept a wage increase below its initial demand Y_{ot}. In practice, of course, these costs cannot be known with any degree of certainty, and they are therefore likely to be subject to constant revision as negotiations proceed.

Starting from the initial wage offer Z_{ot}, the assumption that the employer will be prepared to make concessions so long as the expected costs of such action, or more precisely the present value of these costs, are less than the expected costs of incurring a strike implies that the employer will be prepared to make concessions up to a maximum pre-strike offer of $Z*$.

Panel (ii) illustrates the situation facing the union. The downward-sloping curve $\mu(W)$ indicates the anticipated cost to the union, defined to include both leadership and rank and file, of accepting a wage offer below its initial demand Y_{ot}. By direct analogy with the case of the employer, these costs will partly comprise lower earnings over the future of the wage contract, as well as the imputed costs to the union of a weaker bargaining position in future negotiations.[9] In addition, however, acceptance by the union leadership of a wage increase significantly below its initial demand may serve to undermine the basis of its rank and file support. Thus, the greater the concessions made to management during negotiations, the greater will be the likely costs to the leadership in terms of the achievement of goals such as political survival and popularity with the rank and file, and the promotion of the future growth of union membership.[10]

The upward-sloping 'cost of disagreement' schedule $\emptyset(S)$ reflects the union's estimate of the strike costs associated with achieving any given wage increase in excess of the management's initial offer Z_{ot}. Again, these cannot be known with any certainty, and will be subject to constant revision during the course of negotiations.

Combining these two schedules determines the range over which the union is likely to be prepared to make concessions, as well as its minimum pre-strike demand Y_*.

In the situation depicted in Figure 5.1, the employer's maximum pre-strike offer Z_* is in excess of the union's minimum demand Y_*, indicating that a compromise wage settlement is possible without the need for recourse to strike action. In reality, however, bargaining will always involve attempts by each party to conceal its true position and thereby create uncertainty, and this may well undermine the prospects for a peaceful settlement.[11]

For example, the speed of concession of one party during negotiations may affect the other's evaluation of the likely costs of disagreement. In terms of Figure 5.1, if the employer were to concede Z_* at an early stage in negotiations, the union might be led to suspect the validity of its claim that this was indeed its maximum 'pre-strike' offer. The union might therefore be led to make a downward revision in its expected costs of disagreement schedule to a position such as $\emptyset^1(S)$. The result is a shrinkage of the union's concession range, an upward revision in its minimum acceptable pre-strike offer to Y^1_*, and an increase in the probability of a strike.

The implication of this analysis is that the probability of a strike in period t is dependent upon the relative sizes of the union's initial demand Y_{ot}, and the management's initial offer Z_{ot}, and on the bargaining attitudes of the negotiating parties, as defined by the ratios of their respective strike costs to concession costs. Formally:

$$P(S)_t = \alpha\left((Y_{ot} - Z_{ot}), b_{et}, b_{wt}, b_{ut}\right) \qquad (1)$$

where b_{et} is the bargaining attitude of the employer, b_{wt} that of the rank and file, and b_{ut} that of the union leadership. The sign of α_1' is expected to be positive since a large gap between union demands and employer offers is likely to be associatd with an increase in the probability of a strike; while α_2', α_3' and α_4' are expected to be negative, since employers, union rank and file, and union leadership are all assumed to be less willing to precipitate a strike when the costs of such action are high relative to the costs of making concessions.

Within this framework, variations in strike probability can be related to a broader range of economic variables by specifying the respective determinants of Y_{ot}, Z_{ot}, b_{et}, b_{wt}, and b_{ut} and substituting into equation (1).

It is assumed initially that union wage demands, Y_{ot}, are positively associated with the degree of excess demand in the labour market (X_t), the expected rate of price inflation ($\dot{P}^e_t$), workers' current wage expectations ($\dot{W}^e_t$), and the level of profits (D_t). That is:

$$Y_{ot} = \beta(X_t, \dot{P}^e_t, \dot{W}^e_t, D_t) \qquad (2)$$

where $\beta'_1, \beta'_2, \beta'_3, \beta'_4 > 0$.

The next stage in the development of the model is the specification of the employer's wage equation. In practice, any variable that influences the union in formulating its demand Y_{ot}, is also likely to influence the employer in formulating its offer Z_{ot}. Hence, the specification of the two equations is likely to be virtually identical. For any given explanatory variable, therefore, the impact on strike probability can only be unambiguously determined if the union demand Y_{ot}, and the employer offer Z_{ot}, are affected in opposite directions. Unfortunately, this is not always the case, a fact which provides the key to many of the ambiguities that have plagued the empirical estimation of previous strike models.

Consider, for example, the state of the labour market. In the presence of positive excess demand, unions are likely to seek to exploit labour's relative scarcity by increasing their wage demands, not least because the anticipated effects of such action on the overall level of employment will be small. However, labour market tightness also means that employers will have an incentive to bid more aggressively for workers in order to fulfil their labour requirements. The effect on union demands and employer offers is thus in the same direction and the net impact on strike probability is ambiguous.

Similar problems arise over the interpretation of the effects of slack labour markets, since these are likely to cause corresponding reductions in

both wage demands and wage offers. Under centralized bargaining, however, the situation is likely to be somewhat more complex. For example, when bargaining is typically carried on at the industry, regional or national level, negotiated settlements frequently emerge as something of a lowest common denominator, tailored so as not to strain the financial position of more marginal employers. This procedure then allows some scope for less marginal firms to concede a variety of discretionary plant-level supplements, particularly during periods of labour market tightness. This, of course, is the familiar phenomenon of wage drift. One important implication of this process is the possibility that employers may then use periods of labour market slack and higher unemployment to cut back on these supplements[12] - action that may provoke shop floor protest and an increase in strikes. Moreover, a positive association between strikes and employment from this source may be further reinforced by other factors. Specifically, the much larger size of bargaining units relative to the size of the national economy under more centralized systems may serve to make strikes a more potent weapon of protest against high unemployment.

In addition to responding to the current level of the excess demand for labour, union and employer behaviour will also depend upon their expectations concerning its likely movement over time, $(\dot{X}^e_t)$. Thus, even when unemployment is high, expectations that it will be falling over the life of the contract may encourage unions to increase their demands. This is particularly likely to be true where unions are convinced of a strong government commitment to full employment. Again, however, employers will also be responding to the same signals, albeit with different perceptions, and may be equally prepared to make increased concessions on the basis of expectations of increasing labour market tightness. Much is likely to depend upon their perceived

flexibility to respond to changed conditions over the contract period - on the possibilities, for example, for discretionary wage drift. In general, the greater this flexibility , the greater the likelihood that employers will exercise caution in granting concessions when unemployment is falling, and hence the greater the probability of a strike. This reasoning points to the existence of a positive relationship between increases in excess demand and strikes. An alternative interpretation is, however, possible. If, as Smith (1976) has argued, unions are basically historically oriented, referring to recent levels of excess demand when framing their wage demands, while employers are future oriented, acting on the basis of projections extrapolated from current changes in excess demand, it follows that the latter will be inversely related to strikes (i.e., that increasing unemployment will be positively associated with strike activity). On a priori grounds, therefore, it appears that the relationship between strikes and labour market changes is ambiguous.

Turning to the question of inflation, this clearly provides an incentive for unions to increase their wage demands in order to safeguard their members' real incomes.[13] However, inflation also affects employer behaviour, and provided there is no system of price restraint in operation[14] employers will find it easier to pass on higher wages as higher prices during inflationary periods. Moreover, there is some evidence to suggest that employers are generally prepared to accept arguments about the effect of inflation on workers' living standards as a legitimate bargaining issue.[15] The net effect on strike probability will therefore depend upon the extent to which the evaluation of the two parties differs with respect to the expected rate of inflation. During periods when inflation is fairly constant, the actual inflation rate and the expected inflation rate are likely to converge, making incorporation into current wage agreements less problematical. During periods when the

inflation rate is accelerating, however, the expected inflation rate and the actual inflation rate are likely to diverge, resulting in the emergence of 'unanticipated' inflation. In addition to increasing the degree of uncertainty surrounding collective negotiations, and thereby providing more room for disagreement, unanticipated inflation is also likely to cause increased rank and file dissatisfaction with existing wage agreements, and therefore produce increased pressure on the union leadership to reopen negotiations. Under such circumstances, the probability of a strike will almost certainly be increased.

As far as the determination of workers' wage expectations, $\dot{W}^e_t$ is concerned, the existence of 'wage transfer mechanisms' has been recognized as an important feature of the collective bargaining system for some time. These mechanisms arise as a consequence of what has variously been described as 'pattern' or 'comparability' bargaining; terms which essentially refer to the tendency for trade unions to pursue wage policies designed to establish or maintain relationships between the wages of different groups of workers, either within a given industry, or in relation to workers in other industries. As a result, for any wage claim formulated by a union, or union confederation, the size of settlements reached elsewhere will be of considerable importance in determining the appropriate 'going rate'.

Workers' wage expectations are also likely to be strongly influenced by recent changes in their real wages, or more precisely, as Wilkinson and Turner have argued in the British context, by changes in their real wages net of income tax.[16] Thus, the greater the erosion of workers' net take-home pay through the combined effects of inflation and a progressive tax system, the greater will be their current wage expectations. Formally:

$$\dot{W}^{e}_{t} = \phi(\dot{W}^{o}_{t-j}, R_t) \qquad (3)$$

where $\dot{W}^{o}_{t-j}$ is the 'going rate' of wage settlements; and R_t is the extent of recent erosions in workers' net take-home pay. It is assumed that $\phi_1' > 0$ and $\phi_2' > 0$, since increases in both variables are likely to cause unions to make upward revisions to their wage expectations. Moreover, these conclusions would appear to apply irrespective of the structure of bargaining, although it might be argued that under more centralized systems, settlements reached elsewhere would be somewhat more 'visible'.[17]

In practice, employers are just as likely to be interested in the wage increases agreed to by other employers, and particularly in those paid by their competitors, as are the trade unions. On the one hand they will want to ensure that their labour costs do not get out of line, while on the other they will want to avoid threatening their existing labour supply by paying significantly below the going market rate. Consequently, in the absence of peculiar extenuating circumstances, the employer has little incentive to hold out against the 'going rate' of settlements, a fact which implies that the net effect of $\dot{W}^{o}_{t-j}$ on the probability of a strike is indeterminate. Such reasoning is clearly not applicable to the tax variable R_t, which is totally outside of the control of the individual employer. The impact of this variable on strike probability is therefore unambiguously positive.

Finally, consider the case of the profits variable D_t. For the individual employer, high profits imply an increased ability to pay, and are therefore likely to be associated with higher wage offers. On the other hand, even though management is more able to give concessions when profits are high, the union is also likely to increase its demands in order to obtain a bigger

share for its members. Hence, a priori, the net impact of the profits variable on strike probability would also appear to be indeterminate.

Under centralized bargaining the same arguments clearly apply, although the situation is again complicated by the tendency for employer concessions to be tied to the financial position of the marginal employer. This may well make 'ability to pay' a somewhat more contentious issue, particularly at times when either aggregate profits, or the overall profit share is low, producing a more pronounced inverse relationship between strikes and profits under centralized bargaining arrangements.

The last stage in the development of the model is the specification of the economic determinants of the respective bargaining attitudes of employers (b_{et}), union leadership (b_{ut}), and union rank and file (b_{wt}). These have been defined for the various parties to negotiations as equal to the costs of incurring a strike relative to the costs of conceding on the opponents' terms. From this it follows that increases in the costs of strike action, ceteris paribus, are likely to be associated with a greater willingness to concede, and hence fewer strikes.

For the employer a major element in strike costs will be foregone profits, so that where these are high, employers will be more willing to make concessions to union demands to avert a strike. For manufacturing firms, however, this conclusion may not be invariant with respect to the level of accumulated stocks. If these are high the firm may be able to withstand even a fairly lengthy stoppage without significant loss. Indeed, it is not unheard of for employers to seek actively to precipitate strike action at such times. Hence, one would expect a positive relationship between the level of stocks held by a firm and the employer's strike propensity.

There are also a priori reasons for expecting that employers' strike costs will be affected by conditions prevailing in the labour market. Rees (1952), for example, has suggested that the ability to replace strikers with non-strikers diminishes as unemployment falls. Indeed, he used this as one explanation for the observed tendency for strikes to move pro-cyclically. Although one may question the validity of this proposition within the institutional contexts prevailing in a number of Group of Ten countries, particularly in connection with legal prohibitions against the use of strike breakers,[18] the general relationship might still hold if, as Holt (1974) has suggested, tight labour market conditions are associated with a significant inrease in the quit rate experienced by a struck firm. According to Holt, the ready availability of alternative employment opportunities may persuade the individual worker to attempt to improve his position via a relatively low cost job change, rather than through taking part in a potentially costly strike. Such behaviour could clearly impose substantial replacement costs on an individual employer, particularly if he has made significant investments in training. An important caveat must, however, be entered in the context of centralized bargaining. Under these circumstances the risk to individual employers would be substantially reduced, given the common involvement of fellow employers in any possible strike action.

The above hypotheses may be summarised formally as follows:

$$b_{et} = \mu(D_t, I_t, X_t) \qquad (4)$$

where D_t is the profit rate; I_t is an index of the level of stocks held by the firm; X_t is the degree of excess demand in the labour market; and where, on the basis of previous reasoning, it is expected that for both decentralized and centralized bargaining structures:

$$\mu_1' > 0, \quad \mu_2' < 0, \quad \mu_3' > 0.$$

Turning to the union rank and file, a major element in strike costs will be foregone earnings, with the precise amount depending on both the availability of alternative income and the length of the strike.[19] As Table 5.1 indicates, this is subject to considerable international (as well as intertemporal) variation.

Table 5.1
Average Strike Duration:
Ten Countries 1951-68; 1969-76

	1951-1968	1969-1976
Belgium	7.6	10.7
Canada	17.3	13.6
France	1.6	1.6
Germany	6.0	4.8
Italy	3.4	3.2
Japan	4.1	2.7
Netherlands	4.5	5.7
Sweden	19.1	9.9
U.K.	3.3	7.9
U.S.A.	15.2	16.5

Source: I.L.O. Yearbook of Labour Statistics - various issues

Notes: Duration calculated as annual average working days lost divided by the annual average number of workers involved.

In the case of short stoppages, which in fact account for the lion's share of strikes in Britain, France, Italy and Japan, these costs are probably insignificant, and are therefore unlikely to be the subject of detailed calculation by strikers. With more protracted stoppages, however, the availability of alternative income will be crucial. In most countries, income from such institutional sources as strike pay and tax rebates will still result in a significant shortfall below normal income levels,[20] so that if a reasonable level of consumption is to be maintained, additional sources such as casual work by strikers or their families, past savings, and debt financing must be called upon. Indeed, variation in these latter items is likely to be a major source of variation in rank and file bargaining attitudes.

For a strike at the level of the individual plant, casual work is more likely to be available as a supplementary source of income for strikers and their families during periods of labour market tightness.[21] Considering this source of alternative income in isolation, therefore, suggests that rank and file willingness to strike will be increased by the presence of positive excess demand for labour. Under centralized bargaining, however, where all workers in an industry are called out simultaneously, part-time work is unlikely to be a viable option, thus partially reducing the strategic value of tight labour markets, at least in relation to strike costs.

In terms of the availability of savings and debt financing commitments, much will depend upon workers' past income/consumption patterns. If, as Levitt (1953) has argued, workers are more prone to incur debt commitments that restrict their ability to finance a strike during periods of prosperity, then variations in strike costs from this source will be pro-cyclical.[22] If the state of the Labour market is then taken as a satisfactory general indicator of economic prosperity, this implies a positive relationship between an important element of strike costs and the degree of positive excess demand.

Combining all of the above arguments, it would appear that the overall relationship between strike costs (and hence willingness to strike) and the degree of positive excess demand for labour is likely to be ambiguous under both centralized and decentralized bargaining agreements. On balance, however, an inverse relationship between strikes and unemployment (as a proxy for strike costs) would seem to be more likely under decentralized bargaining arrangements and where there is a history of lengthy stoppages.

An additional source of potential variation in rank and file bargaining attitudes will derive from the fact that strike costs will also vary in line

with seasonal variations in workers' expenditure commitments. In particular, it seems likely that the probability of a strike occurring will be lower before the summer holidays, and at Christmas, when demands on household income are highest.[23]

Formally, the above hypotheses may be summarised as follows:

$$b_{wt} = \Psi(X_t, Y_t) \qquad (5)$$

where, as before, X_t represents the degree of excess demand in the labour market, and Y_t is a seasonal variable proxying expenditure commitments, with $\Psi'_1 \gtrless 0$ and $\Psi'_2 > 0$.

For the union leadership a major element in financial costs will be the payment of strike benefits during official strikes. The precise amount involved will depend on the rate of benefits paid per striker, the proportion of the membership called out (which will clearly depend upon the size of the bargaining unit), and the length of the strike. During large protracted stoppages these costs may be substantial, and may pose serious cash-flow problems, particularly since fixed costs such as staff and administration will still have to be met. The ability to pursue a lengthy official strike might thus appear to be related to the union's possession of sufficient financial resources, which in turn might be related to union size and organizational strength. Some important qualifications are necessary, however. In practice, the choice facing the union leadership is unlikely to be a straightforward one between an expensive large-scale strike and no strike at all. Depending on the prevailing structure of bargaining,[24] a variety of intermediate positions are possible. For example, a series of token strikes, or a small strike in a key area, may be just as effective a device for pressuring employers as a large stoppage, yet will be much less costly. Equally,

systematic sanctions short of a strike (such as an overtime ban or work to rule) may prove even more cost-effective. Clearly, only in the case of the latter substitution will strike probability be affected, yet it is by no means clear that such substitutions will necessarily be confined to unions with limited resources. On a priori grounds, therefore, the nature of the relationship between union organizational and financial strength and strike propensity is ambiguous.

In addition to financial costs, the union leadership is also likely to pay close attention to the political costs of strike action. These costs will tend to be relatively low (i.e. the political costs of conceding to employers relatively high), when rank and file militancy is high, or when rival factions within the union or union federation are pressuring the leadership to push for larger concessions.

Summarising the above hypotheses formally gives:

$$b_{ut} = \lambda(Q_t, M_t) \qquad (6)$$

where Q_t is an indicator of union organisation and financial resources, and M_t an index of rank and file militancy, with $\lambda_1' \gtrless 0$ and $\lambda_2' < 0$.

Substituting (2), (3), (4), (5) and (6) into (1) yields:

$$P(S)_t = \alpha(X_t, \dot{X}^e_t, \dot{P}^e_t, \dot{W}^o_{t-j}, R_t, D_t, I_t, Y_t, Q_t, M_t) \qquad (7)$$

where on the basis of previous reasoning it is expected that under decentralized bargaining:

$$\alpha_1' \lessgtr 0, \alpha_2' > 0, \alpha_3' \gtrless 0, \alpha_4' > 0, \alpha_5' \gtrless 0, \alpha_6' > 0, \alpha_7 < 0, \alpha_8 \gtrless 0, \text{ and } \alpha_9 > 0.$$

Bearing in mind several important caveats in relation to the effects of the state of the labour market and the impact of profits, similar relationships are also anticipated under more centralized bargaining.

II. An Operational Specification of the Model

The transformation of the above model into a form suitable for estimation purposes involves the specification of precise operational counterparts to the dependent and explanatory variables. Assuming that the probability of a strike occurring in any given period can be broadly approximated by the number of stoppages occurring in that period,[25] an operational form of the model in quarterly strike frequency may be specified as follows:

$$S_t = a_o + a_1 U_t + a_2 \dot{U}_t + a_3 \sum_{i=0}^{n} b_i \dot{P}_{t-i} + a_4 \sum_{i=0}^{m} C_i \dot{W}_{t-i}$$

$$+ a_5 R_t + a_6 D_t + \sum_{i=1}^{3} a_{7i} Y_{it} + a_8 I_t + a_9 T_t + e_t$$

where:

U, $\dot{U}$ = the aggregate level, and rate of change of unemployment, indicating the current and expected state of the labour market respectively.[26]

$\sum_{i=0}^{n} b_1 \dot{P}_{t-i}$ = quarterly lagged values of the year-on-year change in the general index of retail prices, proxying price expectations.[27] The variable is specified in expectational form to reflect the fact that, in the absence of money illusion, workers will try to anticipate future price increases to prevent their wages from continually falling behind changes in the cost of living. Moreover, the terms of the analysis of our model, it is the very fact that these expectations are likely to diverge among the negotiating parties that serves to reduce the prospects for reaching a peaceful settlement.

$\sum_{i=0}^{m} c_i \dot{W}_{t-i}$ =quarterly lagged values of year on year changes in wage rates, [28] as a proxy for the average rate of going wage settlements.

R_t =ratio of total disposable income to total personal income before tax, as a proxy for the impact of the erosion of after tax income. [29]

D_t =an aggregate index of corporate profitability, expressed either as gross real trading profits or the ratio of gross profits to total employee compensation, [30] proxying both ability to pay and employer's strike costs.

$\sum_{i=1}^{3} Y_{it}$ =seasonal dummy variables for the second, third, and fourth quarters of the year, proxying variations in workers strike costs and/or periods of increased bargaining activity.

I_t =ratio of manufacturing stocks to the output of manufacturing industry, proxying one element of employer's anticipated strike costs.

T_t =trend term.

e_t =disturbance term.

The expected signs on the coefficients are:

$a_1 \gtrless 0$ $a_2 \gtrless 0$, $a_3 > 0$, $a_4 \gtrless 0$ $a_5 < 0$, $a_6 \gtrless 0$, $a_8 > 0$, $a_9 \gtrless 0$,

and on the seasonal dummy variables $a_{7.2} > 0$, $a_{7.3} < 0$, $a_{7.4} < 0$.

Because of data limitations, the application of this quarterly model is confined to the United Kingdom. For the purposes of international comparisons, an annual model of the following form is substituted:

$$S_t = b_0 + b_1 U_t + b_2 \dot{U}_t + b_3 \dot{P}_{t-i} + b_4 \dot{W}_{t-j}$$
$$b_5 R_t + b_6 D_{t-k} + b_7 I_t + b_8 T_t + e_t$$

All variables are as previously defined, except for the price and wage terms, which are expressed as simple rather than distributed-lag values.[31] The expected signs on the coefficients are identical to those assumed in the quarterly specification.

It will be noted that both the indicator of union organizational and financial resources, D_t, and the index of union militancy M_t, have been dropped from the operational specifications of the model. This is largely because of the difficulties involved in finding satisfactory proxy measures for these variables. Thus, even though Hines (1964) has argued that the change in the percentage of the labour force unionized is a suitable indicator of trade union militancy, and while this indicator has been used with some success by Hunter (1973), there remain several difficulties associated with its use. First, the consistency of the measure as a proxy for militancy has been strongly questioned (Burrows and Hitiris 1970; Godfrey 1971; Purdy and Zis 1972, 1974). Second, it can be shown that the rate of change of unionization is itself a function of the rates of change of wages, prices, and unemployment, and of the level of union density (Bain and Elsheikh 1976). Third, on a purely practical level, in the context of the U.K., union membership data is only available on an annual basis making it inappropriate for a study using quarterly data; while at the international level such data is either unavailable or notoriously unreliable.[32]

Similar problems arise with respect to the measurement of the unions' organizational and financial resources, although here, there are also precedents for the use of proxy indicators. For example, both Snyder (1975, 1977) and Shorter and Tilly (1974) have employed aggregate union density as a

composite indicator of the extent of union organization, its potential control over resources, and its capacity for collective action. This practice is open to criticism on several counts. First, there is the obvious inability of an single aggregate index to represent adequately such a broad and disparate complex of forces, especially as there is no guarantee that they will always necessarily move together. Doubt must therefore be cast over the inter-temporal consistency of such an indicator. Second, union density (like

its rate of change) is not independent of the influence of economic factors. Finally, establishing the causal significance of any observed relationship between union density and strikes, particularly when they are specified contemporaneously, is liable to prove problematical; partly because of their joint dependence on economic factors, but also because it is not clear which variable is cause and which is effect. In particular, as has been argued previously, strikes may actually be a forerunner to unionization, rather than vice versa (Olson, 1965).

Before we can proceed with the task of estimating the above equations for the ten countries in the present sample, they must be supplemented in at least one important respect, since no analysis of strike activity can be considered wholly adequate unless it takes into full account the impact of the numerous attempts that have been made to supplant free collective bargaining with some form of incomes policy. In addition, allowance must also be made for the possible impact of variations in the institutional environment on bargaining outcomes, including, in particular, the pursuit of macropolitical objectives by organized labour. These issues, together with that of the effects of incomes policy intervention on the process of wage determination, are considered in detail in Chapter 6.

Conclusions

The purpose of this chapter has been to construct an operational specification of a simple model of the collective bargaining process. The starting point was the common proposition that the probability of a strike is positively related to the difference between the initial demand of the union on the one hand and the initial offer of the employer on the other. Bargaining was then seen as involving both sides in granting concessions based upon

their (uncertain) subjective estimates of the respective costs associated with this course of action relative to those of holding firm and thereby risking a strike. In considering the determinants of these costs, in addition to the usual economic parameters such as the state of the labour market and the level of profits, considerable weight was also given on the side of the union to the likely internal political costs of any given course of action.

The operational specification emerging from this analysis suggests that strikes are likely to be more frequent during periods of rapid inflation and when employers are carrying large stocks. On the other hand, it suggests that they will be less frequent when the proportion of worker's take-home pay absorbed by the state in direct taxes is low, and when their expenditure commitments are high. Conditions prevailing in the labour market, both in terms of the current level of unemployment, and in terms of changes in that level, the going rate of wage settlements, and the state of corporate profitability are also considered to have a crucial bearing on the frequency of strikes, however the direction of their effect is seen as ambiguous, at least on a priori grounds.

An additional conclusion was that these predictions also appear broadly appropriate regardless of whether bargaining is undertaken on a decentralized basis at plant level, or on a more centralized basis at the industry, regional, or national level. Two qualifications must, however, be added in the context of more centralized bargaining. Namely, that low levels of unemployment may not offer the same strategic advantages to labour in terms of lower potential strike costs, while high levels may appear less constraining. Secondly, low aggregate corporate profitability is likely to have a stronger influence in limiting employers' offers because of the practice of tying wage contracts to the performance of the most marginal firm.

Footnotes Chapter 5

1. For example, Carl M. Stevens, "Regarding the Determinants of Union Wage Policy", Review of Economics and Statistics, Vol. 35, 1953, pp. 221-28; J. Pen, The Wage Rate under Collective Bargaining, Harvard University Press, 1959; Carl M. Stevens, Strategy of Collective Bargaining Negotiation, McGraw-Hill, 1963; Bevars DuPre Mabry, "The Pure Theory of Bargaining", Industrial and Labour Relations Review, Vol. 18, 1965, pp. 479-502. Reference should also be made to the classic study of Hicks, The Theory of Wages, Macmillan, London, 1963 and Ashenfelter and Johnson (1969).

2. This is true, for example, of the models developed by Ashenfelter and Johnson (1969) and J.R. Hicks, The Theory of Wages, Macmillan, London, 1963.

3. The model of Ashenfelter and Johnson (1969) is an exception.

4. Thus, as Streek (1979) has argued in the German context, where bargaining units are large relative to the national economy union actions will have more easily predictable macroeconomic consequences, allowing them to "calculate stategically that the cummulative effects of their bargaining could actually contradict their members' interests". See also Chapter 6, p.11.

5. A distinction could also be made between shareholders or senior management on the one hand and management negotiators on the other, however, the implications of such a distinction are much less significant within the present context than is the case with the union. Under different circumstances, however, such as bargaining between a union and the local management of a multinational company with a high degree of centralized control, the distinction may be an important and necessary one.

6. For example, an unusually large demand from the union could indicate a change in bargaining attitude, possibly implying greater intransigence, or greater militancy.

7. There is evidence to support the existence of rational financial calculation over and above the usual justification on 'as if' grounds. According to Daniel, for example, 'The majority of management negotiators evaluated intuitively the risks associated with enduring any interruption to work against the benefits that they might gain through not conceding the point at issue. But there was a substantial minority of (usually large) establishments in which management sought to do more systematic cost/benefit analysis.' W.W. Daniel, 'Wage Determination in Industry' P.E.P. p. 62. These conclusions were based upon a survey of 254 representative manufacturing establishments.

8. R. Hyman, Strikes, Fontana, London, 1974, p. 112.

9. To quote Hicks,'Weapons grow rusty, and a union which never strikes may lose the ability to organise a formidable strike, so that its threats become less effective'. Ibid., p. 146.

10. See, for example, A.M. Ross, 'Trade Union Wage Policy' Berkley, 1948, Chs. 1-3.

11. In practice excessive gaming behaviour is likely to be ruled out since it is in the long-run interests of both parties to establish a high level of credibility with the other. Indeed, rational behaviour is likely to lead both parties to establish jointly agreed rules and procedures governing acceptable negotiating practices and defining legitimate bargaining issues, as these will serve to reduce uncertainty to the benefit of both of them.

12. This is argued by Soskice (1978).

13. Such a response may, however, be mediated if there is a system of automatic wage indexation in operation as in Italy and Belgium, or if contracts typically carry cost of living allowance (COLA) clauses.

14. This was the case in France.

15. See for example W.W. Daniel (1976).

16. See F. Wilkinson and H.A. Turner, 'The Wage-Tax Spiral and Labour Militancy' in D. Jackson, H. Turner and F. Wilkinson, Do Trade Unions Cause Inflation?, Department of Applied Economics, Cambridge, 1975.

17. Documentary evidence from countries with more centralised bargaining structures - such as Belgium, Sweden and Germany supports this contention. See S. Barkin (1975).

18. Even in the absence of formal legal prohibitions, unions may prevent the use of strike breakers through picketing. Much clearly depends upon: the nature of the industry; the extent of union solidarity; and the extent of trade union membership.

19. The critical determinant of worker behaviour is not so much actual strike costs as workers' perceptions of these costs. These perceptions are likely to be strongly influenced by past experiences of strike action. In particular, previous successes may lead workers to discount the expected costs of current or future strike action and thus increase the probability of its occurrence.

20. Institutional arrangements differ. While strike benefits are paid by unions in support of official strikes in all member nations except Italy, the level of provision varies considerably, being highest in Sweden and Germany and lowest in France and the U.K. In the U.S. a survey conducted in 1972 revealed an average weekly benefit of $25 (Sheldon M. Kline, "Strike Benefits of National Unions", Monthly Labour Review, vol. 98, 1975, pp. 17-23. For a detailed study of the British context see J. Gennard and R. Lasko, 'The Individual and the Strike', British Journal of Industrial Relations, Vol. 13, 1975, pp. 346-70.

21. In the British context the validity of this assumption is, however, open to question in the light of recent research into how strikers manage financially during strikes. Gennard and Lasko, for example, have observed on the basis of their examination of two major British strikes that 'Little causal work was done by workers in either strike'. One reason for this was 'the continual expectation that the strike would end "tomorrow" so that it would have been pointless

to take a job'. The authors also observed that, 'There was a lack of information about the jobs that might be available,' while several people involved, 'found that neither public not private employment agencies would help unless they resigned their present employment'. J. Gennard and R. Lasko, 'The Individual and the Strike', British Journal of Industrial Relations, Vol. 13, 1975, pp. 346-70.

22. If, as Levitt implies, workers' expenditure patterns and debt commitments are a major determinant of their strike propensity, then strikes would, according to this argument, vary counter-cyclically. This prediction is contradicted by most of the available empirical evidence which finds strikes increasing with economic prosperity.

23. The timing of contract expirations or bargaining rounds will also have a bearing on strike probability, so that the estimated outcome will represent the net effect of strike costs and the extent of bargaining activity.

24. The prevailing structure of collective bargaining may have a significant impact on the form that the strike takes. Under a highly centralised bargaining structure as in Sweden, an official stoppage to change an agreement may involve bringing out all the workers in an industry and will therefore be very costly. Under a highly decentralised system such as the U.S., by contrast, only one plant may be involved so that a union may call several dozen separate official strikes without bringing out all the workers in the industry. See H.A. Clegg, Trade Unions Under Collective Bargaining, Basil Blackwell, Oxford, 1976, pp. 75-82.

25. If, at each point in time, the strike probability for each bargaining unit is approximated by the ratio of the total number of strikes to the total number of bargaining units, and the number of bargaining units is constant through time, then strike probability varies with the number of strikes.

26. Previous studies have used the level of unemployment, U, as a proxy for the degree of excess demand in the labour market. However, it has been argued that when excess demand for labour is rising the unemployment rate alone will miss-state the true level of excess demand. In these cases the rate of change of unemployment, $\dot{U}$, should be included along with U. See, for example, A.G. Hines, 'The Determination of the Rate of Change of Money Wage Rates and the Effectiveness of Incomes Policy' in Johnson and Nobay (eds) (1971), The Current Inflation, Macmillan, London.

27. The empirical estimation of expectations is a contentious issue. The present specification is based upon adaptive expectations and specified empirically via the use of an Almon Lag, the length of which is empirically determined.

28. The wage and price terms are defined and specified analogously.

29. The inclusion of this variable may be viewed as a test of the Wilkinson-Turner thesis that the 1969/70 strike wave was associated with the erosion of workers' net disposable income. The specification of the variable in unlagged form reflects the hypothesis that workers refer to

their current tax/income relationship in determining their current wage claims.

30. For precise definitions of the profits variable and for information on data sources for the various countries in the sample, see Appendix 1.

31. All lags are experimentally determined with no a priori judgement placed on their relative lengths in different countries.

32. This is particularly true of France and Italy. For an extensive examination of trade union membership data see G.S. Bain and R.J. Price Profiles of Union Growth, Basil Blackwell, Oxford, 1980.

Chapter 6

Incomes Policy, Collective Bargaining, and the Nature of the Insitutional Environment

It was suggested in Chapter 5 that no analysis of the collective bargaining process could be considered wholly adequate unless it took full account of the impact of the numerous attempts that have been made to supplant free collective bargaining with some form of incomes policy. In practice this has been a fairly common phenomenon, with virtually every member nation of the Group of Ten having succumbed at some time or another to what Ulman (1973) has called its 'catnip effect'. It is therefore necessary to broaden the discussion to consider a number of important aspects of such policies. These include the form and purpose of incomes policies as well as the institutional and political circumstances under which they are most likely to stand some chance of long term success. In this connection, attention is also directed towards a brief review of their overall performance in each of the member nations of the Group of Ten during the post war period. Finally, consideration is given to a more formal analysis of the reasons for the emergence of different forms of incomes policy, and for their impact on both strikes and the process of wage inflation utilizing the framework of the bargaining model developed in Chapter 5.

I. Incomes Policy: A Simple Definition

For the purposes of the present analysis the term incomes policy may be conveniently defined as the operation of some system for effectively restraining the growth of money incomes in order to keep them from rising faster than the rate of growth of real national income. This simple definition is

preferred to more precise and detailed alternatives for several reasons. First, it has advantages over one which specifically emphasises the interventionist role of the state in the process of restraint, since while not excluding the latter, it also allows for the possibility of a private sector policy operating without direct government intervention - as has been the case, for example, in Sweden. Second, the definition is broad enough to encompass the wide variety of measures and degrees of compulsion that have been applied under the heading of 'incomes policy' in different countries. Thus, it is capable of including the imposition of 'freezes' of differing lengths, the specification of mandatory or voluntary 'guidelines', as well as various types of 'exhortation' and 'moral suasion'. Similarly, it is broad enough to allow for the use of the policy as an essentially short-run device, aimed at breaking inflation expectations (as in Canada and the United States); as well as its use as a more or less permanent feature of the operation of a co-ordinated system of wage and salary determination (as in Sweden, and in the Netherlands until 1963). Finally, by not specifying the precise policy target employed in justifying the restraint of incomes, the definition allows for such diverse, though inter-related, motives as: the pursuit of balance of payments equilibrium (as in the Netherlands, Sweden, and the United Kingdom); attempts to ease the trade-off between inflation and unemployment, (as in Germany, the United States and Canada); as well as the effective 'programming' of the growth of relative factor shares, (as in Germany and Belgium).

II. Incomes Policy and the Nature of the Institutional Environment

Beyond the question of definitions, the first substantive issue that must be considered from a comparative perspective is that of the circumstances under which incomes policies are likely to represent an institutionally and

politically viable option. Expressed another way, it is important to establish the circumstances under which organized labour, as the main group whose co-operation is needed, might be prepared to accept some durable system of effective wage restraint. This issue has attracted the attention of a number of authors. For example, Heady (1970) has suggested two fundamental prerequisites for the emergence of a durable cooperative incomes policy. First, that the working class must be sufficiently united politically to elect a socialist government that will administer a wages policy in such a way that workers, or their leaders, are convinced that the policy is not simply a way of depressing their incomes relative to others in the economy. And second, that workers must be sufficiently united to form a strong centralized union movement capable of administering the policy in a way that will avoid imposing excessive strain on the loyalty and cohesion of its membership.

This argument has been further elaborated by Barbash (1972) in connection with the analysis of the operation of what he has termed 'economic policy unionism'. Specifically, Barbash argues that the ability of the trade unions to participate in national economic policy in general, and incomes policy in particular, will depend upon the extent to which they share a core of common values with other elements in society, as well as on the availability of mechanisms through which these common values can be converted into mutually acceptable policies and programmes. This he terms 'union integration', a concept which is taken to include the presence of institutions such as centralized union federations, centralized bargaining, industrial unionism, union-party alliances and professionalized union administration. Finally, Barbash emphasises that integration also requires that involvement must in the long run be compatible with the union's protective functions vis à vis its membership. "Self denial", he suggests, "cannot be a permanent feature of the

economic policy in which unions are involved" (Barbash 1972, page 2). Even if this condition is effectively fulfilled, however, integration is still seen as likely to be in potential conflict with such goals as rank and file control, trade unionism as a revolutionary vehicle, and the decentralization of power. Thus, where such goals are paramount, an economic policy form of unionism is unlikely to develop.

The issue of trade union involvement in the operation of incomes policy has also received extensive attention in the context of the recent literature on 'liberal corporatism'. As Lehmbruch (1977) has argued, a co-operative variety of incomes policy is common to virtually every system which carries this label. Moreover, the emergence of a durable machinery for the corporatist involvement of unions similarly presupposes certain basic structural characteristics of trade union organization, including a high degree of centralization and concentration (as in Sweden), although co-operative incomes policies are still seen as possible (though more difficult to implement) where unions are centralized but not concentrated in a powerful central confederation (as in Germany[1]). However, where both centralization and concentration are lacking, and there is a large degree of rank and file autonomy, especially when combined with enterprise or plant level bargaining arrangements (as in Britain, the United States, Canada, Japan, and increasingly also Italy), the ability of union leaders to co-operate in corporatist incomes policies is severely constrained. This is also the case where value concensus is lacking. Thus, where there is a strong class conflict orientation within the labour movement (as in France and, to a lesser extent, also Italy and Japan), union cooperation in incomes policy is seen as becoming highly unlikely.

Closely related to the existence of value consensus is the question of the nature of the relationship between organized labour and government. In this connection, corporatist incomes policy are seen as most common in those countries where working class movements have obtained active participation in the machinery of government, and where by implication trade unions have gained privileged access to both governmental and administrative centres of power. Acceptance of incomes policy has also been associated in the corporatist literature with what may be termed 'exchange relationships', or the operation of some system of government quid pro quo for union acquiescence in the restraint of incomes. Thus, Crouch (1978), has argued that sufficient ideological consensus is unlikely to persist indefinitely unless it is supported by the granting of material concessions, a course clearly made easier during periods of sustained economic growth.[2] Even in the absence of increasing material prosperity, however, some degree of (albeit short-run) consensus may still be possible in a 'legislative exchange', which serves to enhance the legal rights of both unions and workers. Thus, in Britain, the Employment Protection Act of 1975 is argued to have been a partial quid pro quo for voluntary restraint under the social contract. Similarly, in Italy, the Statuto dei Lavoratori, which gave unions a recognized presence at shop floor level, was introduced at a time when government was actively seeking to recruit the unions into tripartite discussions on the state of the economy (Crouch 1978, page 210).

To summarize, the above contributions point to three necessary conditions for the emergence of an effective long term incomes policy. First, the existence of a strong centralized and/or concentrated labour movement. Second, the existence of a centralized and/or well coordinated collective bargaining structure. And third, the existence of a politically united working class,

which has either elected a socialist government, or has gained regularized admission to the decision making apparatus of the state by some other means,[3] (a development which may also be seen as manifesting a high degree of value consensus). Where these three conditions are fulfilled, a fourth may be added as a sustaining characteristic of incomes policy: namely, the existence of an 'exchange relationship' under which some form of material concession is granted in return for union restraint.

These factors are given systematic expression in relation to the member nations of the Group of Ten in Table 6.1. As the table indicates, some form of durable and cooperative incomes policy has emerged in only four of the ten countries: namely, Sweden, the Netherlands, Germany and Belgium; while in a fifth, namely Britain, though incomes policies of various types have been a common feature of the industrial relations landscape for nearly fifteen years, only the most recent social contract of 1975-77 could be realistically described as 'cooperative'. In the remaining countries, where policies have been used at all, they have generally been unilaterally imposed on unwilling labour movements.

Before considering these contrasting developments on a more analytical level, particularly in relation to their implications for the collective bargaining process, it will be useful to review briefly the historical experience of the ten nations with incomes policy.

III. Incomes Policy: The Post-War Experience of the Group of Ten

Sweden

To begin with the case of Sweden, it is clear that the existence of a highly organised working class (both industrially and politically), dominance by Social Democratic Governments, and a highly coordinated system of

Table 6.1 The Institutional Prerequisites for a Cooperative Incomes Policy: The Group of Ten.

Country	Trade Union Structure and Organization			Collective Bargaining		Labour's Political Power		
	Union membership	Union organizational unity	Confederal control over bargaining (concentration)	primary level	Consolidation of bargaining structure (centralization)	Party splits	Labour's relationship to policy	Incomes Policy
Sweden	very high	unified	high	economy-wide	highly centralized	unified	control	Private sector egalitarian wage policy
Netherlands	medium	religious but joint action	high until 1963	economy-wide to 1963; Industry/company-wide thereafter	highly centralized until 1963	minor	control until 1959; interrupted thereafter	Administered wage policy until 1963
Germany	medium	unified	low	industry-wide	centralized	unified	exclusion until 1966	Concerted Action (1967)
Belgium	very high	political and religious; joint front since 1960	medium	industry-wide	centralized	minor	interrupted participation	Social Programming 1960-1969
U.K.	high	unified	low	company/plant level	decentralized in private sector	unified	interrupted control	social contract 1975-78; pre-1975 imposed incomes policies
Canada	low/ medium	unified	low	plant level	decentralized	unified	pressure group access Federally	imposed incomes policy 1975-1977
U.S.A.	low	unified	low	plant level	decentralized	-	pressure group access	imposed incomes policies
France	low	political/ religious	low	industry level	limited consolidation	major	exclusion since 1958	imposed public sector guidelines
Italy	medium	political/ religious	low	industry level	limited consolidation	major	intermittent coalition participation	exhortation
Japan	low	political	low	company/ plant	decentralized enterprise unionism	major	exclusion since 1949	exhortation

Notes and Sources:

(a) low = < 30%; medium = > 30% < 40%; high > 40% < 60%; very high > 60%

(b) derived from Korpi and Shalev (1979) p.178

(c) derived from Heady (1970); and Windmuller, "The Authority of National Trade Union Confederations: A Comparative Analysis"

(d) derived from review of comparative literature

(e) derived from Korpi and Shalev (1979) p.178

(f) derived from Heady (1970); Shorter and Tilly (1974); and Korpi and Shalev (1979)

(g) derived from Ulman and Flanagan (1971); Braun (1975).

economy-wide bargaining, have all been potentially compatible with the emergence of an effective co-operative incomes policy. Nevertheless, the 'solidarity' wage system that actually emerged has been described as something of a 'borderline case'. The principle reason for this is undoubtedly its unique 'private' character: a designation that derives from its bipartite administration by the Central Trade Union Federation (LO), and the Central Employers' Association (SAF), without active government involvement. This has not been the only distinct feature of the policy, however. In addition, one of the primary aims since its inception in the early 1950's has been the creation of a more just and egalitarian wage structure, rather than merely the promotion of wage restraint. As a result, one important consequence of its operation has been the progressive erosion of economy-wide differentials, a matter which has been of acute concern to the white collar unions (the Central Organization of Salaried Employees, TCO; and the Swedish Confederation of Professional Association, SACO). As these organizations have increased in size and importance within the economy, considerable strains have been placed on both the solidarity wage policy and the prevailing system of coordinated private sector bargaining.

Netherlands

In the case of the Netherlands, as Table 6.1 illustrates, the early post war years were characterised by an industrial relations environment which in objective terms was highly supportive of a cooperative incomes policy. A highly centralised bargaining structure; coordinated action among the separate union confederations (Netherlands Catholic Trade Union Federation, NKV; Protestant National Trade, Union Federation, CNV; and the Socialist Netherlands Federation of Trade Unions, NVV); significant leftist participation in ruling government coalitions; and the powerful motivating force of

post-war reconstruction all contributed to the successful operation of a highly centralised 'guided wage policy'. Towards the end of the 1950's, however, the policy's strong emphasis on wage restraint in the face of increasing national prosperity and progressively tightening labour markets began to take its toll. Growing strains within the labour movement over the trade union centers' rigid enforcement of the policy were further compounded by their relative isolation from the rank and file, and the absence of any firm union organizational structure at plant level capable of effectively defusing the situation. Moreover, at the national level, the cooperative basis of the wage policy was further undermined by the departure, in 1958, of the Labour Party from the ruling coalition, signalling a change in the political climate towards greater conservatism. The net result was that by 1963 the wage policy had effectively disintegrated. The challenge to the system did not rest there, however. In the years since 1963, the Netherlands has witnessed a significant degree of decentralisation in its collective bargaining structure, with a steady shift in the centre of gravity towards the industry and enterprise level. These developments, together with increasing union power on the shop floor, have conspired to undermine the prospects for the re-establishment of a cooperative policy, with the result that recent interventions on the wage front have been reduced to the form of unilaterally imposed freezes in the face of union opposition.

Germany

In Germany, the emergence of a cooperative incomes policy in the form of 'Concerted Action' also provides ample testimony to the need for an appropriate industrial relations environment. In the area of union structure, for example, while the influence of the central union federation (DGB) over the individual industrial unions is weak, the centralisation of power within the industrial unions themselves has nevertheless facilitated the emergence of a

cooperative approach to wage determination. Indeed, elements of an unofficial cooperative wage policy, geared to productivity, have been apparent from the mid-1950's (Bergman and Muller - Jentsch 1975). These developments, based upon the unions' willingness to adapt their demands to the 'requirements of economic stability', were evidently supported initially by the need (as in the Netherlands) for rapid post-war reconstruction. However, they were also strongly facilitated by a bargaining structure in which union actions could be seen as having direct and predictable macroeconomic consequences, allowing unions to "calculate strategically that the cummulative effects of their bargaining could actually contradict their members' interests", (Streek 1979, page 208). This, of course, is much less likely where wage decisions are uncoordinated and typically made at a much more decentralized level.

In the context of labour's political representation, a further important feature of the German experience is the fact that the 'unofficial' cooperative wage policy ultimately achieved its formal status as "Concerted Action" only after the Social Democratic Party (SPD) entered the Grand Coalition in 1967 - a development which firmly underlines the importance of working class participation in government as a precondition for overt union cooperation in wage restraint. Even with this participation, however, strains began to appear within the policy after only two years, as rank and file opposition crystalised in a series of wildcat strikes over the policy's evident failure to guarantee 'social symmetry' between wages and profits. Moreover, these strikes also effectively served notice of a profound grass roots dissatisfaction, both with leaderships' agreement to a cooperative policy of restraint, and with the existing system of internal union representation and decision making. Subsequent responses to these developments have included a greater disposition to decentralise wage negotiations, as well as attempts to

consolidate and channel unofficial action into an official union bargaining strategy which pays more attention than hitherto to shop floor grievances. The net result has been a 'cooperative' incomes policy which has effectively functioned, at least in recent years, as more of an instrument of 'crisis management' (Lehmbruch, 1977, page 107), with its success in wage restraint showing some degree of cyclical fluctuation.

Belgium

In the case of Belgium, conditions would appear to have been broadly appropriate to the emergence of[a] cooperative incomes policy since at least the early 1960's. At that time, the two major union federations (the Confederation of Christian Unions, CSC; and the General Federation of Belgian Labour, FGTB) formed an effective common front in their negotiations with employers. This development was in turn paralleled in the political arena by the more or less concurrent formation of the 'Grand Coalition' between the Christian Social Party (PSC) and the Socialist Party (PSB), which governed Belgium for most of the period from 1961 to 1973. Of possibly even greater significance has been the fact that since the end of the Second World War organised labour has achieved a high and increasing level of involvement in a wide variety of national socio-economic institutions whose operation has effectively come to displace several of the conventional functions of political parties. Thus, the private sector 'social partners' have frequently negotiated bilateral agreements involving "cheques drawn on the government for its signature, calling for legislation, or regulation or budgetary action", and producing "a form of institutionalization ... (that) ... has blurred the classic distinction between collective bargaining and government action" (Lorwin 1975, page 25). This phenomenon has been particularly true of the national bipartite agreements negotiated under 'Social Programming'. These

agreements, though not officially constituting a cooperative incomes policy in a formal sense, (indeed, Belgian labour has been consistently hostile to the idea), have nevertheless produced results not too far removed from one. As Pepper (1975) has argued, "pragmatically agreements have been tied into a rounded system of direct controls, subsidies, regulations and taxes to effect a largely regulated income system", (Pepper, pp.182-3). Indeed, further evidence in favour of this contention may be derived from the significant escalation in unofficial strikes that ocurred in 1970. Many explanations have been advanced to account for these strikes, but one factor common to them all is the existence of a growing gap between union leadership and their rank and file over the former's rigid adherence to Social Programming and its no-strike clauses, under which workers found themselves effectively tied into 'agreements of poverty', (Molitor, 1978).

The United Kingdom

In the context of the United Kingdom, it is clear that several of the institutional prerequisites for the emergence of a durable cooperative incomes policy are lacking. The absence of either strong concentration or centralisation within the labour movement, a large measure of rank and file autonomy, and a predominantly plant level bargaining structure in the private sector have all conspired to limit severely its prospects for success. Nevertheless, incomes policies in some form have been a fact of life in British industrial relations for over fifteen years. Given this, it is perhaps not surprising that their most durable and cooperative expression has come under Labour Governments. Thus, under Labour's incomes policy of 1964-70 the TUC established its own machinery for vetting the wage claims of its members, at least until the policy eventually broke down in the face of shop floor resistance

in 1969. The next attempt at a cooperative incomes policy emerged from the defeat of the Conservative Government of 1970-74, following the miners' challenge to the statutory policy introduced in 1972. This emerging 'social contract,' undoubtedly fostered by the prevailing atmosphere of economic crisis, rested more heavily on the special links between the TUC and the Labour Party than any previous policy, and was in many respects the most successful - at least in terms of its achievement of wage restraint. However, once again the policy came to grief at the hands of mounting shop floor pressure, with the final demise coming in the 'winter of discontent' of 1978.

The remaining cases

With regard to the five remaining countries, where incomes policies have been introduced at all, they have typically been imposed unilaterally by governments. In Canada, following the breakdown of tripartite negotiations over their voluntary introduction, statutory wage and price controls were imposed unilaterally between 1975 and 1977 as an anti-inflation measure. Similarly in the United States, wage-price guideposts were instituted by the Council of Economic Advisors in 1962, in an attempt to reconcile the fuller utilisation of manpower with price stability. These lasted until 1966, when they were abolished following the settlement of the airline machinist's strike. They then lay dormant until 1971 when they were re-instituted, initially in the form of a wage freeze, and thereafter in less stringent form until their removal in 1973.

In the cases of France, Italy and Japan, comprehensive incomes policy intervention has generally not been actively employed as a tool of macro economic policy. Thus, while income moderation via concertation was attempted in France in 1964, with the institutional preconditions lacking, recourse was

instead made to the manipulation of the Toutée procedure which was used to restrain wages in the public sector between 1964 and 1967 (Reynaud 1975). In Italy and Japan, incomes policy intervention has been predominantly in the form of exhortation. However, this is not to suggest that it has been without effect. Indeed, in the case of Italy there are significant signs of wage moderation between 1965 and 1968 in response to government requests.

IV Post-War Incomes Policies and the Institutional Environment: A Summary.

Summarizing the findings of this brief historical review, it is possible to identify three broadly distinct forms of incomes policy intervention. First, what may be termed durable cooperative incomes policies; defined as those in which income restraint has been achieved on a fairly long term basis with the active cooperation of trade union leaders. Second, incomes policies that have been instituted primarily as a short-term measure, based upon formal unilateral intervention by government. And third, policies in which emphasis has been placed primarily on exhortation, rather than more formal interference with the collective bargaining process. In addition, reference to Table 6.1 suggests that each of these forms of incomes policy interventions has in turn been associated with a broadly similar configuration of institutional factors. The first, corresponding with the emergence of some form of durable cooperative incomes policy, consists of systems where unions are organizationally secure, collective bargaining is an accepted and well established method of job regulation, the bargaining structure is centralized or well coordinated, and the relationship between organized labour and government is a close one. Three countries from our ten country sample - namely, Sweden, Germany and Belgium - may be unambiguously characterized in this way; while a fourth -

namely the Netherlands, may be given a marginal attachment as a transitional case, given the breakdown of its highly centralized system of wage determination in the early 1960's, and a subsequent shift towards decentralization in its bargaining structure.

A second configuration, corresponding with a primary reliance on exhortation, lies at the opposite end of the institutional spectrum. Here union organization is rather less secure, collective bargaining - though still an important means of job regulation - is relatively immature and hence fairly fragmented, and organized labour is largely excluded from the machinery of government. France and Italy are obvious candidates for inclusion under this configuration, since both have been characterized as possessing poorly institutionalized bargaining structures, and both have unions that are organizationally weak (Synder 1975, Korpi and Shalev 1979). They are also countries in which strikes are viewed primary as vehicles of political protest, rather than as economically motivated sanctions against employers (Shorter and Tilly 1974, Snyder 1975). The other member of this group, namely Japan, has also been characterized in this way, despite its now well established system of enterprise unionism (Korpi and Shalev 1979).

A third institutional configuration, corresponding to predominantly short-run unilateral incomes policy intervention, takes up an intermediate position. In this case, while the labour movement is relatively secure, and collective bargaining well established, the bargaining structure is predominantly decentralized, and organized labour's influence over government is confined largely to that of a pressure group. The United States, Canada and the United Kingdom all broadly approximate this pattern. Moreover, it is worth noting that in each of these countries conventional economic strike models have achieved a significant degree of empirical success.

These propositions are summarized in Table 6.2, which in turn provides a useful point of departure for the examination of the two closely interrelated issues addressed in the remainder of the chapter. These are: first, the provision of a more formal explanation for the emergence of the different forms of incomes policy intervention that have been observed under different institutional arrangements; and second, an examination of the likely effects of these different forms of intervention on the cyclical pattern of strikes and wage inflation.

Table 6.2 Institutional Configurations and Incomes Policy: The Group of Ten.

	Group 1	Group 2	Group 3
Institutional Characteristics:	(i) organizationally secure unions	(i) organizationally secure unions	(i) divided, less secure unions
	(ii) well established centralized bargaining	(ii) well established but decentralized bargaining	(ii) immature and fragmented bargaining
	(iii) politically integrated labour movements	(iii) union movement afforded pressure group access	(iii) politically excluded labour movements
Incomes Policy:	durable cooperative policy	short-run unilateral intervention	primarily exhortation
Countries:	Sweden Germany Belgium Netherlands (until 1962)	United States Canada United Kingdom Netherlands (1963 onwards)	France Italy Japan

V. Incomes Policy, the Institutional Environment and Strikes: A Formal Analysis.

As an aid to understanding the reasons behind the emergence of the different forms of incomes policy intervention depicted in Table 6.2, as well as for their differential impact on the cyclical pattern of strikes and wage inflation, it will be useful to give more explicit consideration to the collective bargaining goals that are likely to be pursued by the various parties to negotiation under different institutional arrangements. Each of the industrial relations configurations depicted in Table 6.2 will be considered in turn. In the interests of continuity it will be convenient to start with a bargaining relationship of the type depicted in Chapter 5. That is, one based upon decentralized bargaining and broadly corresponding to an institutional configuration classified as Group 2 in Table 6.2.

Group 2 Countries

Starting with employers, the bargaining goals held under Group 2 institutional arrangements (i.e. the U.S., Canada, the U.K. and the Netherlands after 1963), are assumed to be expressed by a utility function of the following form:

$$f = f(r, q, p, s) \quad f_1'<0;\ f_2'>0;\ f_3'>0;\ f_4'<0$$

Where: f is the utility of the employer; r is the rate of growth of real wages over the contract period; q is an index of the firm's productive performance; p is the extent of management's in-plant prerogatives; and s is the occurrence of a strike.

Profit maximizing behaviour may be viewed as leading the firm to seek to minimize the growth in real wages, r, and maximize its in-plant prerogatives, p, subject to its need to maintain and motivate its labour force, and thereby

satisfy its desire for on-going improvements in its productive performance q. Needless to say, one factor that could detract from the achievement of this goal is the occurrence of a strike, although under certain circumstances this may be seen as a necessary price for moderation in r.

Next, consider the bargaining goals of the union. Here, as in Chapter 5, and following Ross (1948) and Ashenfelter and Johnson (1969), a distinction is made between union leaders and the rank and file. Thus, the former are seen as pursuing the survival and growth of the union as well as their own personal political survival. However, since the achievement of these objectives depends largely upon leaderships' ability to satisfy rank and file bargaining goals, we have:

$$h = h(m, s) \quad h_1' > 0; \quad h_2' < 0.$$

where: h is the utility of the union leadership; m is the utility of the rank and file; and, as previously, s is the occurrence of a strike.

The bargaining goals of the rank and file are assumed as follows:

$$m = m(r, e, p, s) \quad m_1 > 0; \quad m_2 > 0; \quad m_3 < 0; \quad m_4 < 0$$

where: r is the rate of growth of real wages; e is the membership's. perception of equity, based upon their relative position in the overall wage hierarchy, and their income share vis à vis profits; p is the extent of management's in-plant prerogatives, and s is the occurrence of a strike.

Rank and file utility is assumed to be maximized via the maximization of real wage growth, r, and their relative wage position, e; and minimization of the employer's in-plant prerogatives, p. For both leadership and rank and file, the occurrence of a strike is viewed as a disbenefit, and hence considered only if it is likely to produce more than compensating increases in r or e, or reductions in p.

Against the background of these utility functions, collective bargaining may be viewed as an institutional process for resolving the conflicting goals of management and unions in order to reach a mutually acceptable balance of prerogatives, and a mutually acceptable level of wage growth over the contract period. In short, a bargaining outcome that is broadly consistent with both profitability and the maintenance of worker motivation.

Thus far the analysis is fully consistent with that presented in Chapter 5, where the primary concern was the specification of the likely economic determinants of the wage goals of unions and management, and the resolution of the gap between them. However, it is also important to consider how collective bargaining under Group 2 institutional arrangements might be affected by the intervention of government as a fourth party to negotiation. This introduces an additional set of bargaining goals as follows:

$$g = g(r, h, m, f, s) \quad g_1'<0;\ g_2'>0;\ g_3'>0;\ g_4'>0;\ g_5'<0$$

where, as previously, r is the rate of growth of real wages; h, m and f are the goals of the union leadership, the rank and file, and firms respectively; and s is the occurrence of a strike.

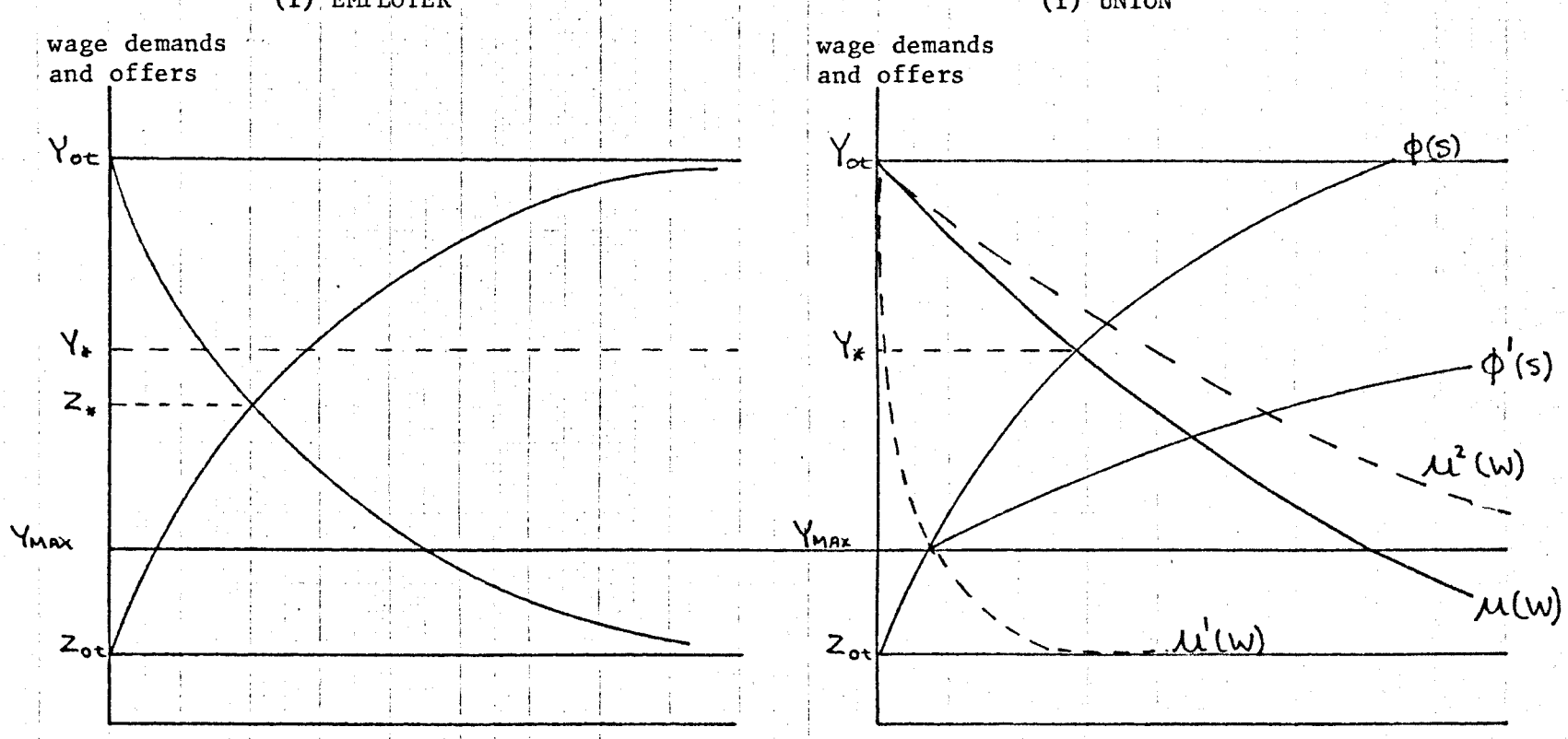
This function may be explained as follows: first, the government is assumed to be concerned over the achievement of a variety of potentially conflicting economic policy targets, including the so-called 'magic triangle' of full employment, price stability and external balance. Since direct intervention in the wage determination process in the form of incomes policy represents one possible solution to this conflict, it is assumed that an inverse relationship will exist between government utility and the rate of growth of real wages, r. In addition, the government is viewed as pursuing a variety of political objectives, foremost amongst which are its prospects for re-election. The latter are, in turn, assumed to depend upon its ability to satisfy

satisfy the goals of its various constituents. Hence, government utility may be seen as depending positively on the respective utilities of union rank and file, union leadership and employers[4]. Finally, like the other parties to negotiation, the government is assumed to attach disutility to the occurrence of strike action.

Examination of this utility function clearly reveals the nature of the dilemma facing government: achievement of its goal of real wage moderation, though potentially consistent with the bargaining goals of firms, will detract from the utility of both union rank and file and union leadership. While one solution might be the pursuit of a voluntary policy, two aspects of the institutional environment are likely to work against this. The first is the lack of any strong political bond between government and organized labour. The second is the decentralized nature of the bargaining structure. Under such a structure any individual union leadership which moderates its wage demands has no grounds for anticipating that others will follow its lead. Indeed, given the public goods nature of the supposed benefits of wage restraint, there is a powerful incentive for individual bargainers to 'cheat'. Any individual union leadership adhering to the policy therefore risks undermining its members' position in the wage hierarchy, with adverse consequences for the value of the equity index, e. It follows that where incomes policies are seen as necessary, they are likely to be imposed unilaterally as short-run measures, usually during the early part of a government's term in office.

To explore the effects of these policies on the cyclical pattern of strike activity, it is useful to return to the framework of the bargaining model developed in Chapter 5. The relevant details are presented in Figure 6.1.

FIGURE 6.I



Strike Costs and Concession Costs

Strike Costs and Concession Costs

Figure 6.1 illustrates a situation in which under free collective bargaining the union's minimum pre-strike demand Y^* is in excess of the employers' maximum pre-strike offer Z^*, implying that a compromise will only be reached after recourse has been made to strike action. Suppose, however, that an incomes policy with a wage ceiling of Y_{max} is unilaterally imposed. If this policy is accepted by both union leadership and rank and file, then the scope for disagreement over the acceptable wage increase is significantly reduced, partly because a major element of uncertainty is removed from the bargaining arena, but also because rank and file acceptance of the policy removes one important element of the political costs to the leadership associated with agreeing to a wage offer significantly below their initial demands. The result is a leftward shift in the cost of agreement schedule to a position such as $\mu 1(W)$ where the probability of a strike over a wage related issue is considerably reduced.

Next consider the case where the policy receives official union acquiescence but fails to secure rank and file support. Under these circumstances, growing rank and file resentment is likely to increase significantly the political costs to the union leadership of acceding to the policy, particularly if it has been in place for some time, causing a steady rightward shift in the costs of agreeing schedule to a position such as $\mu 2(W)$. Nevertheless, the probability of a strike may still be lower than under free collective bargaining. This is possible because the imposition of a statutory maximum will also tend to increase the subjective strike costs associated with obtaining wage increases above this level, first because the strike will be more likely to have political overtones and may thus turn into a lengthy confrontation strike, and second because the political costs to the union as a whole in terms of the loss of public goodwill will also tend to be higher. In

practice, the combined effect of these factors might well make the costs associated with striking to obtain a settlement in excess of the specified limit appear prohibitive. In effect, this implies a cost of striking schedule that becomes infinitely elastic at the wage ceiling Y_{max}. Even if perceived strike costs do not rise this far, however, the result will still be a rightward shift in the costs of striking schedule above Y_{max}, to a position such as $\phi 1(S)$ where its intersection with $\mu^2(W)$ implies the possibility of a no-strike settlement, albeit in excess of the specified wage ceiling. This would, of course, imply the emergence of unofficial wage drift.

There is an additional possibility; namely, that leadership reluctance to vigorously pursue wage increases because of the associated macro political costs will lead to the emergence of strains within the union itself, possibly even culminating in a rank and file revolt, and ultimate recourse to unofficial action. However, if this is considered a possibility by the leadership they may very well judge the internal political costs of acceding to the policy to be greater than those of official opposition, so that the probability of official strike action may actually increase[5]. In any event, it is clear that once the policy is dismantled, or disintegrates, the increased political costs to the leadership of observance will no longer be counter-balanced by the increased political costs to the union as a whole of striking, and cumulative dissatisfactions are then likely to be voiced through a significant increase in strike activity, if only as a means of restoring union solidarity[6].

This reasoning lends only qualified support to the common assumption of previous studies[7], that incomes policies (even when unilaterally imposed) will tend to be associated with a significant decline in strike activity during their operational phases. In short, this conclusion is not independent of the

degree of acceptance accorded to such policies by the union rank and file. In addition, it is also unlikely to be independent of the form that the restraint on wages takes - whether as a clearly specified statutory limit, or merely as a set of guidelines. For example, it could be argued that for any given level of acceptance by union rank and file, striking to gain increases in excess of a statutory maximum would be associated with higher subjective strike costs than those associated with breaching a set of guidelines, and hence with fewer strikes. Indeed, this result might be further reinforced by the fact that more stringent policies will probably also be associated with greater reductions in the degree of uncertainty surrounding collective bargaining. In practice, however, the degree of acceptance a policy can command may not be independent of the type of restraint it employs. A clearly defined statutory maximum may, for example, be less acceptable to the rank and file than a set of guidelines. Consequently, while in general it might be expected that an incomes policy will be associated with a reduction in strike activity, no a priori judgment is made as to the relative size of this effect with respect to its different forms.

Formally, these arguments may be summarized as follows:

$$S_t^u = f(F_{t1} * A_{t1}^u \quad \ldots \quad F_{tn} * A_{tn}^u ; F_{tm}^u)$$

$$f_1;\ f_2<0 \text{ and } f_3>0$$

Where S_t^u is the frequency of strikes occuring under a unilaterally

imposed incomes policy; $F_{t1}...F_{tn}$ represent the various forms of restraint employed during operational phases of the policy; $A^u_{t1}...A^u_{tn}$ represent the degree of rank and file acceptance of the various operational phases of the policy; and F^u_{tm} represents the breakdown or re-entry phase following the demise of an incomes policy.

Group 1 Countries

As outlined above, the institutional environment prevailing in Group 1 countries (i.e. Sweden, Germany, Belgium and the Netherlands until 1962), has been associated with the emergence of some form of durable co-operative incomes policy. In terms of the impact on strikes, the first point that must be made is that the institutional and political prerequisites to the emergence of this form of policy--including organizationally secure unions, well established and centralized bargaining, and politically integrated union movements--also bear a remarkable resemblance to those originally advanced by Ross and Hartman in connection with the withering away of the strike . This, of course, implies that those factors that are conducive to the emergence of a durable and cooperative incomes policy are also likely to be consistent with a significant secular decline in strike activity. However, this says nothing about the effects of cooperative incomes policies on cyclical fluctuations in strikes. To explore this issue, reference must be made to the emergence and operation of what has recently be referred to as 'political exchange relationships' (Pizzorno 1978). These relationships involve a situation under which union leaders are prepared to forego the full exploitation of their short-term

labour market power on a regular basis in exchange for longer run concessions from the state in what amounts to a 'political market'.[8]

To understand the reasons for the emergence of this market, reference must be made to the expanded bargaining possibilities open to the various negotiating parties under Group 1 institutional arrangements. First, the political integration of union leadership with government may be assumed to have the effect of expanding the former's bargaining goals to include the latter's utility as an additional positive argument. That is:

$$h = h(m, s, g) \quad h_1'>0; \; h_2'<0; \; h_3'>0$$

Second, political integration may also be assumed to bring about the expansion of the utility function of the rank and file to include statebenefits acquired through the collective 'political' bargaining of their leaders. That is:

$$m = m(r, e, p, s, b) \; m_1'>0; \; m_2'>0; \; m_3'<0; \; m_4'<0; \; m_5'>0$$

Where r, e, p and s are as defined previously, and b represents exchange benefits acquired from the state as a result of the political bargaining activity of union leaders[9].

Third, the existence of a centralized and/or well coordinated bargaining structure makes the equity variable, e, potentially bargainable. That is, a mutually acceptable value of e may be collectively determined by union leaders, rather than emerging as an external effect of the individual maximization of real wage increases by a large number of small units, as is the case under a decentralized bargaining structure.

In combination with the utility function of the state, the expanded utility functions of leadership and rank and file create a bargaining system in which real wage moderation can potentially be achieved to the mutual benefit of all parties. Specifically, this involves a collective commitment by

individual union leaders to forego maximizing behaviour in the labour market in pursuit of real wage gains (r), in exchange for compensating increases in state benefits (b).[10] Such a transaction leaves rank and file utility unchanged (assuming e is preserved), but increases the utility of government (by reducing r), and the union leadership (by increasing g while leaving m unchanged), as well as employers (by reducing r). Three important labour market consequences follow from this: first, a reduction in the overall level of wage settlements; second, a reduction in the difference between the collective wage goals of unions and those of management[11], and hence a reduction in strike activity (a development which increases the utility of all parties); and third, as a corollary of the above, the reduced responsiveness of both wage changes and strikes to fluctuations in labour market conditions.

The implications for cyclical strike and wage behaviour do not, however, end there, since one further issue that must be addressed is the stability of this political market relationship over time. In practice, there are several reasons for scepticism in this regard. First, political market exchange will be vulnerable to changes in both the political complexion of government and/or any trend towards decentralization in the bargaining structure.[12] Second, it will be potentially vulnerable to intertemporal shifts in rank and file perceptions of the relative value of public versus private benefits (either in general or amongst different factions within the union). Third, the exercise of labour market restraint by union leadership will inevitably lead to the eventual compression of differentials, and possibly also to an increase in the share of profits, both of which will have an adverse effect on rank and file perceptions of equity.[13] Finally, in a highly interdependent world economy, the ability of national governments to guarantee fully their side of any

political bargain is likely to be severely constrained by external events, particularly in connection with the delivery of economic benefits. Any or all of these developments could serve to reduce rank and file utility, and hence also their acceptance of the exchange relationship. Such a development would clearly place the union leadership in an awkward position since the macro political costs of abandoning the restraint policy would be even greater than those under an imposed incomes policy--a consequence which follows from their much closer relationship with government. The presumption, therefore, is that the outbursts of protest against cooperative policies are likely to be of a predominantly unofficial nature.

Formally, this implies a relationship which is qualitatively similar to that pertaining under imposed incomes policies:

$$S_t^c = f(F_{t1} * A_{t1}^c \cdots F_{tn} * A_{tn}^c ; F_{tm}^c)$$

Where S_t^c represents the frequency of strikes under a cooperative incomes policy; $F_{t1} \cdots F_{tn}$ represent the various forms of restraint employed during its operational phases;

$A_{t1}^c \cdots A_{tn}^c$ represent the degree of rank and file acceptance of the various operational phases (which may be presumed to be greater than under an imposed policy, at least initially); and, finally, F_{tm}^c represents the breakdown or re-entry phase of the policy. Under an imposed policy it is assumed that:

$f_1' ; f_2' < 0$ and $f_3' > 0$;

but with f_3' comprising largely unofficial action.

Group 3 Countries

In the case of Group 3 countries (France, Italy and Japan), it has been noted that both collective bargaining and strikes have been characterized as more of a political than an economic activity (Shorter and Tilly 1974; Snyder 1975). However, this does not necessarily imply any significant modification in the utility functions or bargaining goals of rank and file workers in these countries. What it does imply is that union leaderships have sought to fulfil their members' economic goals by means of political action (i.e. a strike directed against government) rather than through more conventional collective bargaining backed by economic action (i.e. a strike directed against employers). The explanation for this is simple. First, union organization has historically been low, a fact which has made the staging of economically effective collective action problematical. Second, collective bargaining has been too poorly developed to provide an effective institutional means of pursuing labour's goals.

From this viewpoint strike action is more likely to be responsive to organization and political variables than to economic ones, a fact which, as noted in Chapter 3, has led to the construction of models in which strike fluctuations are related to changes in labour's organizational capacity (as measured by union density), and to the political vulnerability of the state as proxied by variables such as the number of cabinet changes per period, and the existence or otherwise of election years (Shorter and Tilly 1974). On a practical level, however, these models have achieved only limited empirical success in explaining post-war strike patterns in France and Italy (Snyder 1975). One plausible explanation for this is that while the analyses of the institutional environment on which these models have been based is historically accurate, they have failed to take account of more recent developments.

For example, since the mid 1950's, conventional collective bargaining has become a much more widespread method of job regulation in each of the member nations of Group 3. This in turn implies the emergence of a more economically motivated strategy on the part of union leaderships in pursuit of their members' goals. Nevertheless these institutional developments have not been sufficient to make formal incomes policy intervention either politically or institutionally viable. The political alienation of labour remains too high, and bargaining remains too fragmented. Thus, in the context of incomes policy, reliance on exhortation rather than more formal intervention has left the evolving process of collective bargaining largely unencumbered, and the private parties more free to respond to market forces. No formal allowance is therefore made for an incomes policy effect in either France, Italy or Japan.

VI. Incomes Policy and the Process of Wage Determination

The analysis of the effects of incomes policy on bargaining behaviour presented in the last section clearly has important implications for the wage determination process, and in particular for the likely role of trade unions in that process. In order to consider this in a systematic way it will be useful to examine three conventional hypotheses relating to the effects of trade unions on the pace of wage inflation.

The first is the conventional monetarist proposition that trade unions have no significant effect on labour market pricing behaviour, so that wages are determined solely by the level of excess demand (X) and the expected rate of price inflation ($\dot{P}e$). That is:

$$\dot{W} = aX + b\dot{P}e \qquad (1)$$

The second hypothesis is the conventional cost-push view that unions are able to impart an inflationary bias to the wage determination process via the exercise of some form of market power, so that the expectations Phillips curve is displaced upwards at all levels of excess demand by a shift parameter M. That is:

$$\dot{W} = aX + b\dot{P}^e + M \text{ with } M > 0 \qquad (2)$$

where M is some index of trade union militancy reflecting the trade union's propensity to translate potential into realized power.

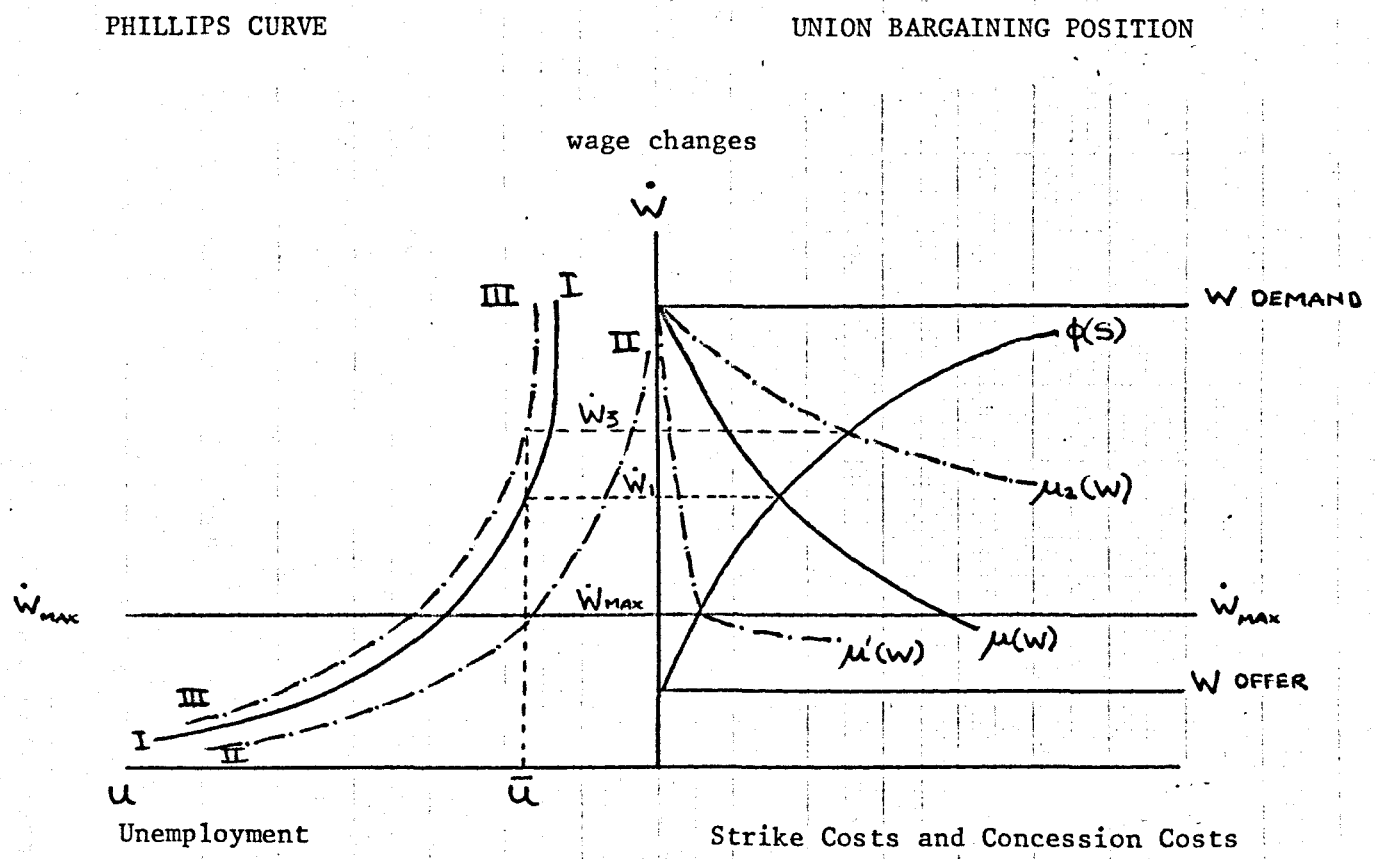
The third hypothesis, which derives from the work of Friedman (1951) is that trade unions will impart a deflationary bias to the wage determination process by producing a downward displacement of the expectations Phillips curve at all levels of labour market excess demand. This occurs, according to Friedman, because of the bureaucratic nature of unions and their need to operate through the periodic and time consuming process of collective bargaining, both of which tend to reduce wage changes below the level that would pertain in an unconstrained market. That is:

$$\dot{W} = cX + b\dot{P}^e \text{ with } c < a \qquad (3)$$

While each of these hypotheses is theoretically possible, the third (i.e. that unions depress the pace of wage change at all levels of positive excess demand) is often seen as intuitively implausible. (Trevithic and Mulvey 1975). In fact, however, this is precisely the implication that follows from our analysis of the effects of a cooperative incomes policy. Namely, that under certain types of industrial relations structure union leaders may be willing to forego the full exploitation of their short term labour market power by accepting an incomes policy which sets wages at a level below those that would have pertained under free collective bargaining.

The situation is illustrated graphically in Figure 6.2.

Figure 6.2


PHILLIPS CURVE
UNION BARGAINING POSITION
wage changes
$\dot{w}$
III
I
II
W DEMAND
$\phi(s)$
$\dot{w}_3$
$\dot{w}_1$
$\mu_2(w)$
$\dot{w}_{max}$
$\dot{w}_{max}$
$\mu'(w)$
$\mu(w)$
W OFFER
III
I
II
u
$\bar{u}$
Unemployment
Strike Costs and Concession Costs

The right hand quadrant in Figure 6.2 depicts the bargaining situation facing the union (or union federation) with $\emptyset$ (S) representing the cost of striking schedule, and μ (W) the cost of agreement schedule. The left hand quadrant depicts a conventional Phillips curve with wage changes on the vertical axis and unemployment on the horizontal axis.

Under free collective bargaining the union's minimum pre-strike demand is given by $\dot{W}_1$, which is related to the level of unemployment $\bar{U}$ via Phillips curve I. Suppose, however, that the prevailing industrial relations structure is broadly compatible with the emergence of a cooperative incomes policy that is endorsed by both leadership and rank and file, and that a wage ceiling of $\dot{W}_{max}$ is agreed to under its auspices in an attempt to reduce the rate of inflation while still maintaining an acceptable level of unemployment. The result is a leftward shift in the union's cost of agreement schedule to $\mu'(W)$, implying a willingness to forego the maximum pursuit of its bargaining advantage, and restraint in both its wage demands to $\dot{W}_{max}$, and in its use of the strike. The net effect on the Phillips curve is its downward displacement to position II.

As our discussion of the actual operation of cooperative incomes policies in Section III revealed, restraint has invariably been associated with growing rank and file resentment. Over time this will manifest itself as a rightward shift in the union's cost of agreement schedule back towards μ (W), and possibly even beyond to a position such as μ_2 (W). However, as argued in Section V, this may still not be expressed as official protest because of the political costs to the leadership of breaching the policy, a fact which effectively

makes their strike cost schedule perfectly elastic at $\dot{W}_{max}$. The most likely result is thus an outburst of unofficial rank and file action, directed as much against official unionism as the incomes policy itself.

One important feature of this unofficial action is that it puts pressure on employers for increased wage settlements through channels that are largely separate from those of the conventional system of collective bargaining, and thereby constitutes a potential challenge to it. Moreover, it occurs at a time, following the effective restraint of wages, when ability to pay is likely to be enhanced. In combination, these factors will give employers a strong incentive to meet union demands in an attempt to defuse the unofficial challenge before it can seriously undermine the established channels of collective bargaining. The consequence of this action will be a leftward shift in the Phillips curve to position III. This argument is consistent with a wage equation of the following form:

$$\dot{W} = cX + b\dot{P}^{e} + S \text{ with } c<a$$

Where the shift parameter, S, is an indicator of the extent of rank and file protest over wage restraint.

This analysis implies a crucial role for both union leadership and rank and file in the wage determination process under cooperative incomes policies. Even where the institutional prerequisites to a fully fledged cooperative policy are lacking, trade union behaviour may still be of crucial significance. Thus, even under a unilaterally imposed policy, short term acquiescence on the part of the union, followed by official rejection will have the effect of imposing a similar time series profile on the pattern of wage changes.

VII. Incomes Policy and Wage and Strike Behaviour: An Operational Specification

The production of an operational specification of the preceding analyses of the impact of incomes policy on strike and wage behaviour inevitably involves placing heavy reliance on proxy indicators. This is necessary simply because many of the variables employed in the theoretical specifications are not easily measured directly. For example, there exist no ready empirical counterparts to such variables as the degree of leadership cooperation in the introduction of an incomes policy, the degree of rank and file acceptance, or the extent of rank and file protest over wage restraint. Given this, in the operational specification of the strike equation, use is made of dummy variables which, where appropriate, distinguish between both different types of restraint, and between different phases of an incomes policy's life cycle. Thus in the former connection, where it is relevant, a distinction is made between 'hard' and 'soft' policy phases (Hunter 1973) reflecting different degrees of compulsion in the restraint of incomes; while in the latter connection use is made of a 'breakdown' or 're-entry' dummy variable, specified for the period immediately following the demise or disintegration of an incomes policy. Expressed in terms of the formal model outlined in Section V, this variable serves to pick up the emergence of cumulative rank and file unrest expressed either unofficially, as a protest against leadership involvement in restraint, or officially as the union leadership adjusts to the fact that the internal political costs of accession to the policy are no longer counterbalanced by the external political costs of striking in breach of it.

Incorporating these dummy variables into the strike model developed in Chapter 5 produces an operational equation of the following form:

$$S_t = a_0 + a_1 U_t + a_2 \dot{U}_t + a_3 \dot{P}_{t-i} + a_4 \dot{W}_{t-j} + a_5 R_t$$
$$+ a_6 D_{t-k} + a_7 I_t + a_8 T$$
$$+ a_9 F_{1t} + a_{10} F_{2t} + a_{11} F_{3t} + e_t$$

Where F_{1t} and F_{2t} are dummy variables representing qualitatively different operational phases of incomes policy, and F_{3t} represents the breakdown or re-entry phase of the policy. It is assume that:

$$a_9, a_{10} < 0 \text{ and } a_{11} > 0$$

All other variables are as previously defined.

Turning to the impact of incomes policy on the process of wage determination, use is also made of proxy variables. Thus, in the absence of any direct index of rank and file protest over wage restraint, recourse must be made to an indicator of the aggregate level of strike activity. Specifically, since total working days lost is by far the most comprehensive strike index available - reflecting both the length and size of disputes, in addition to their frequency - it might be assumed that it also constitutes the most appropriate proxy indicator for variations in the level of worker protest. While this may be true in general, in the context of cooperative incomes policies this conclusion is in need of some modification. In particular, because the emergence of worker protest over cooperative incomes policies is likely to be in the form of strike action that is predominantly unofficial (a fact deriving from the high external political costs to union leaders of pursuing official action in breach of the policy) it is also likely to be associated with a significant change in the overall shape of the strike. Thus, while the frequency of stoppages will undoubtedly rise, their size and/or length is likely to fall as a result of their unofficial character, a fact which will lessen significantly their impact on the overall working days lost figures. Moreover, in addition

to this effect, the value of the working days lost series as a proxy for rank and file protest is likely to be further undermined, if union leaders subsequently seek to alleviate the internal political strains resulting from their cooptation into wage restraint, by precipitating increases in official action in pursuit of non-monetary gains.

Reflecting these considerations, two wage equations are therefore specified as follows:

$$\dot{W}_t = b_0 + b_1 U_t^{-1} + b_2 \dot{P}_{t-1/2} + b_3 V_{t-1} + e_t \qquad \text{with } b_1, b_2, b_3 > 0$$

$$\dot{W}_t = C_0 + C_1 U_t^{-1} + C_2 \dot{P}_{t-1/2} + C_3 S_{t-1} + e_t \qquad \text{with } c_1, c_2, c_3 > 0$$

Where:

$\dot{W}_t$ = the rate of change of money wages in manufacturing defined as $[(W_t - W_{t-1})/W_{t-1}].100$;

U_t^{-1} the reciprocal of the level of unemployment;

$\dot{P}_{t-1/2}$ the rate of change of consumer prices lagged by half a period and defined as $(\dot{P}_{t-1} + \dot{P}_t)/2$, where $\dot{P}_t$ is defined analogously with the wage variable as $[(P_t - P_{t-1})/P_{t-1}].100$;

V_{t-1} working days lost in manufacturing industry lagged one period; and

S_{t-1} strike frequency in manufacturing industry lagged one period.

The lags on the strike variables are included to reflect the fact that the collective bargaining process involves the negotiation of what is, in effect, a form of futures contract, with wage gains accuring over the life of the contract rather than contemporaneously.

Each of the above equations is fitted to data derived from the ten countries in the sample, with the a priori expectation that working days lost will be a less adequate predictor of wage change behaviour under cooperative incomes policies than strike frequency.

Before proceeding to the estimation of the operational equations specified above, one further issue must be addressed. Namely, that the use of strike variables in wage equations has been the subject of a substantial amount of criticism. For example, while it is not disputed that strikes represent the ultimate sanction available to unions in pressing for higher wages, it is argued that use of the officially compiled aggregate statistics involves the introduction of too many ambiguities and potential errors to be at all illuminating. First, it is far from clear which of the published aggregate strike indices is the most appropriate, and, while most studies have concentrated on strike frequency, no justification has typically been given for such a choice. Equally, no account has generally been taken of the well documented under-recording of the actual number of stoppages in the officially published frequency statistics, or for their failure to reflect such other crucial dimensions of strike activity as strike length and strike size - both of which might be presumed to effect employer's behaviour in granting wage concessions. While the latter criticism cannot be made of the present study since both frequency and working days lost [illegible] employed, it remains vulnerable to the argument that neither strike index is an unambiguous indicator of changes in the exercise of union power or worker discontent. Thus, strikes may increase as a result of employer action, and hence be a reflection of the exercise of employer power rather than union power. Alternatively, power may be exercised without resort to a strike at all, either because of an effective strike threat, or because of recourse to a variety of non-strike sanctions.

In addition, aggregate strike statistics clearly reflect disputes over a large number of issues other than simply wage increases, so that variations in strike indices reflect "far more than simple fluctuations in a number of homogeneous occurrences" (Purdy and Zis 1974). Moreover, even if attention was confined to disputes over wages or wage related issues (assuming such data to be available), their use is still problematical given that many disputes involve multiple issues whose relative importance may change during the course of a dispute. Finally, and in many ways most damning is the thorny issue of the argued lack of any clearly defined theory of wage determination under trade unions capable of unambiguously linking strike activity to wage changes in a causal sequence running from the former variable to the latter (a problem also touched on briefly in Chapter 4). In the light of this barrage of criticism, the use of official strike indices in the present study would clearly seem to warrant some justification.

The first line of defence is purely practical. On the basis of previous studies (Nordhaus 1972; Perry 1975), and on the basis of the results presented in Chapter 4, considerable doubt exists over the adequacy of the basic excess demand/price expectations model as the sole explanation of recent wage inflation experience among the member nations of the Group of Ten. Second, the analysis of this chapter has pointed to the existence of a key role for trade unions - both leadership and rank and file - in determining the pattern of wage changes, particularly in relation to the macro economic and macro political constraints imposed by incomes policy. Moreover, the analysis has further established the necessity for supplementing the basic excess demand/price expectations equation with some indicator of rank and file wage expectations that is broadly responsive to the effects of incomes policy. Third, the preceding analysis has also established that the occurrence of

strikes is likely to be significantly related to a variety of factors in addition to the level of excess demand and price expectations, including, most notably, the effects of incomes policy.

It is against this background that a strike index is advanced as a suitable proxy indicator. Moreover, given its status as a proxy, it is not necessary that it be definitionally the same thing as worker acquiescence in, or hostility over, the current pace of wage changes; merely that it fluctuate broadly in line with the latter. Thus, the fact that not all strikes are over wages, or that not all strikes derive from changes in worker or union leadership attitudes and behaviour, does not necessarily invalidate the use of an aggregate strike index. Finally, as regards those criticisms that are based upon the proneness of strike statistics to measurement error (and notably under-recording), while such criticisms are undoubtedly of some validity, they could equally well be applied to any officially compiled statistical series, including the unemployment statistics and consumer price index. Moreover, in the context of the strike series, provided that recording practices are consistent over time, these series may still be employed as a potentially valid proxy indicator.

Conclusions

The aims of this Chapter were broadly twofold. First, to examine the reasons for the emergence of the variety of different forms of incomes policy intervention adopted by the member nations of the Group of Ten during the post-war period; and second, to examine the impact of these policies on the time series pattern of strike activity and wage inflation. In the context of strikes, it is argued that the institutional prerequisites to the introduction of a cooperative incomes policy - including centralized bargaining and the existence of a government sympathetic to labour - are also broadly consistent

with those factors commonly associated with a secular decline in strike activity. In addition to producing secular declines, however, it is argued that the high subjective costs to union leaderships of breaching a cooperative incomes policy will also be associated with cyclical declines in official strike action, at least during its operational phases. Following from this, it was suggested that, in the context of wage determination, leadership agreement to wage restraint under cooperative incomes policies will result in a pattern of settlements significantly below those determined under a free market. An inevitable consequence is predicted to be mounting rank and file dissent, which, given union leadership's unwillingness to act in the face of the perceived macro political costs, is likely to surface eventually as unofficial strike action. This action, combined with a generally enhanced ability to pay on the part of employers, and a strong desire to defuse emerging grass roots protest before it could solidify into an effective longer-run challenge within the plant, is then seen as instrumental in precipitating significant wage concessions. On the basis of this reasoning it is hypothesized that a significant positive relationship will exist between the occurrence of unofficial strike action and wage changes under cooperative incomes policies.

Where the institutional prerequisites for the emergence of a cooperative incomes policy are lacking, the situation is somewhat more ambiguous. While incomes policies are still possible, their introduction is of necessity likely to be based upon unilateral government imposition, rather than active union co-operation. One important consequence of this is a much greater degree of uncertainty with respect to both the occurrence of reductions in strike activity, and the effectiveness of the wage restraint programs. However, even under these circumstances, the imposition of incomes policy is

still seen as raising the union leadership's subjective strike costs - in this case because of the risk of strikes turning into protracted confrontations - and hence also leading to a reduction in strike activity during the operational phase of the policy. Once again, mounting rank and file protest is seen as an inevitable consequence, although here there is less of a presumption that the eventual protest will be unofficial in nature. Further, given the unilateral character of their introduction, the life-cycle of incomes policy from introduction through to disolution and/or breakdown is presumed to be much shorter.

Finally, in an operational context, the present Chapter has brought together a variety of hypotheses on the determinants of strike activity and wage inflation in the form of a simultaneous model of strike and wage determination. Within the framework of this model, the current level of strike activity is hypothesized to depend upon such conventional economic factors as the state of the labour market, wage and price expectations, profits, inventories and the tax structure, as well as on the nature of incomes policy intervention. Current wage changes are in turn hypothesized to depend upon the state of the labour market, price expectations and lagged strike activity. The acid test of this model is its explanatory power. This is examined in relation to the ten countries in our sample in Chapter Seven.

Footnotes to Chapter 6

1. In the case of Germany, while concentration is lacking because the federal power of the central union organisation (DGB) is weak, considerable power is nevertheless centralized in the large industrial unions.

2. Economic growth performance among the members of the Group of Ten was largely supportive of incomes policy until the mid 1960s.

3. The working class may also gain access via participation in governing coalitions as in Belgium and the Netherlands, or via active participation in national socio-economic institutions under what has been termed a 'consociational cartel'.

4. The relative weight attached to these separate utilities will depend upon the political complexion of the government. For an interesting exploration of this issue, see Hibbs' (1977) study, "Poltical Parties and Macroeconomic Policy", American Political Science Review, Vol. 71.

5. One potential solution to the leadership dilemma would be to channel rank and file militancy into challenging managerial prerogatives rather than into the pursuit of wage gains.

6. See for example R.E. Walton and R.B. McKersie, A Behavioural Theory of Labour Negotiations, McGraw-Hill, New York, 1965.

7. See for example Vanderkamp (1970) and Hunter (1973).

8. This market analogy is developed in detail in Pizzorno (1978).

9. As we have seen these concessions have included commitments to full employment and price stability, guarantees of social symmetry between wages and profits, improved social welfare benefits, and even supportive labour legislation.

10. The importance of a high degree of unionization, as well as inter-union coordination and/or centralized bargaining is evident here, since by their very nature public benefits will accrue to everyone - union member and non-member alike - regardless of the fulfilment of a commitment to restraint.

11. This does not, of course, imply that non-wage goals, and specifically management prerogatives (p), will be any less contentious.

12. Thus, one factor contributing to the breakdown of a cooperative incomes policy in the Netherlands was undoubtedly the departure of the Labour Party from the ruling coalition in 1958, a move which signalled a shift in the government toward greater conservatism.

13. One might therefore predict that concerns over the wage structure will be of heightened importance under Group 1 arrangements.

Chapter 7.

Empirical Tests of the Strike-Wage Model.

The present Chapter presents and analyses the results obtained from subjecting the simultaneous model outlined in Chapter 6 to empirical scrutiny using post-war data from the Group of Ten. Before considering these results in detail, however, a number of general observations are in order about the estimation procedures adopted. First, in the context of the strike model, the results presented are for the best-fitting equations obtained on the basis of ordinary least squares (OLS) estimation. Variables whose 't values' fell below the value of one were generally dropped from the final estimating equations. Second, while all equations were initially estimated in linear form, in three cases - namely the strike equations for Canada [Germany] and the Netherlands - semi-logarithmic transformations provided more satisfactory results. Finally, in order to correct for the possibility of auto correlation, all equations were transformed according to the autoregressive scheme devised by Cochrane and Orcutt (1949).

In presenting the results, each of the ten countries is considered individually, though for convenience the order of their consideration is dictated by their prevailing institutional configuration as defined in Chapter 6. Starting with those countries in which cooperative incomes policies have emerged, the order of consideration is as follows: Belgium, Germany, the Netherlands, Sweden, France, Italy, Japan, Canada, the United States and the United Kingdom.

BELGIUM

Strike Behavior.

The best fitting strike equation in the Belgian context took the following form[1]:

$$S_t = a_0 + a_1 U_t^{-1} + a_2 \dot{U}_t + a_3 \dot{P}_t^2 + a_4 \dot{W}_t + a_5 D_t + a_6 F_{1t}$$

Two institutionally specific features of this equation should be noted at the outset. The first is the inclusion of a squared price term, $\dot{P}_t 2$, in place of the standard variable (which appeared insignificant in preliminary estimations). This substitution is made to take account of the operation of a system of cost of living escalator clauses, in place for most of the post-war period. The second specific feature is the definition of the incomes policy variable F_{1t}, which in the Belgian context represents the period of 'social programming' from 1960-69 [2].

As Table 7.B.1 illustrates, estimation of the above equation shows it to be consistent with 95% of the variation in aggregate strike frequency over the period 1953-1974. Reference to the 'actual' and 'fitted' values plotted in Graph 7.B.1 offers further confirmation of the equation's explanatory power, illustrating in particular its broad consistency with the strike escalations occurring in Belgium in the early 1970's.

In terms of the performance of individual variables, all coefficients except that on the wage variable are significant. More specifically, the level of unemployment, entered in reciprocal form, appears with a negative sign, implying a positive relationship between unemployment and strike frequency. This is consistent with an interpretation of strikes as vehicles

of protest, or as a primarily defensive rather than offensive measure. It is also consistent with the operation of a political exchange relationship under which union leaders are prepared to forego the full exploitation of their short-term strategic advantage in the labour market. As an interesting contrast, however, and less obviously consistent with these interpretations is the fact that the rate of change of unemployment appears to be inversely related to strikes. Taken together, these findings - that strikes are increased by both high unemployment and falling unemployment - might appear contradictory. A consistent interpretation is, however, possible. As noted in Chapter 5, under centralized bargaining arrangements (such as those in Belgium), individual employers retain some scope for the concession of discretionary plant-level wage supplements during periods of labour market tightness - an obvious potential sweetener to official restraint at the more macro level. Attempts to unilaterally remove these supplements during periods of labour market slack would then imply the possibility of increased strike action at such times if this protest, initially of a largely defensive character, were then carried over into a somewhat more offensive form of action in the early phase of the upswing, as part of an attempt to regain lost ground, the result would be a set of labour market relationships of the type depicted in equation 1.

In terms of the relationship between strikes and inflation, the existence of a positive coefficient on the squared price term would appear to confirm documentary evidence pointing to increased worker militancy over recent escalations in the rate of inflation - escalations which apparently led to some questioning of the validity of the consumer price indices on which the cost of living escalators were based. In the context of the profits variable (expressed as the ratio of current aggregate profits to total compensation),

the existence of a highly significant inverse relationship with strikes suggests the dominant influence of enhanced employer ability to pay and/or high-opportunity costs of striking over the effects of higher union demands during periods of enhanced profitability - a finding consistent with union restraint. Turning to the last of the significant variables, it appears that as expected 'Social Programming' was associated with a significant decline in strike frequency. The effects of entry to free collective bargaining are, however, adequately tracked without the need for recourse to a separate dummy variable.

With respect to the impact of wage changes, their apparent insignificance could be due to their contradictory behavioural implications. Thus, as was noted in Chapter 5, a high 'going-rate' of settlements is likely to increase both union demands and employer offers. In addition, while as Ashenfelter and Johnson 1969 have argued, large real wage increases in the recent past will be associated with a smaller expectations-achievement gap, and hence fewer strikes, a recent history of large increases could equally serve to stimulate expectations and hence make organized labour even more demanding. In the Belgian context, however, the appearance of a positive (though insignificant) relationship between wage changes (in manufacturing) and strikes must also be interpreted in the light of the accutely sensitive nature of the issue of wage differentials, particularly between the North and the South - a situation considerably aggravated by marked changes in the economic performance of these regions. These tensions have emerged with particular significance in the mining industry, where a declining labour force has used solidarity in industrial action to achieve wage gains comparable to those obtained by workers in the more prosperous industrial sectors. This clearly illustrates that a high overall rate of wage increase in manufacturing might be associated with widening differentials and hence increased strike activity based on concerns over 'wage - structure.'

Re-estimation of the strike equation using strikes in manufacturing as the dependent variable would seem to offer some support for the latter interpretation. Thus, as equation 2 indicates, omission of non-manufacturing strikes - including perhaps most significantly those in mining - brings about a change in sign on the real wage term, which though still non-significant, is now inversely related to strike frequency. In addition, the relationship between the level of unemployment and strikes, though still positive, is no longer significant - a finding which may also be attributed to the omission of the economically declining mining sector. The only remaining contrast is the loss of significance of the squared price variable as a factor stimulating strikes in manufacturing.

Wage Behaviour

In the context of the process of wage determination, as equation 3 in Table B.1 indicates, the basic price expectations Phillips curve is able to account for 90% of the variation in hourly wage changes in manufacturing over the period 1953-1974. However, while both unemployment and price terms are highly significant and correctly signed, the size of the coefficient on the price variable seems implausibly high. As equation 4 illustrates this problem is remedied by the inclusion of a lagged strike variable, which it may be noted, enters the equation with a significant positive sign. In addition to confirming the importance of the strike frequency term, equation 4 also produces a worthwhile increase in the equations plausibility and explanatory power. Further confirmation is provided in Graph 7.B.2 which plots the actual against fitted values derived from equation 4. As the graph illustrates, the superior performance of the strike frequency augmented equation derives largely from its predicitive power in relation to the wage settlements generated over the period of 'Social Programming,' during which the standard

equation produces significant overpredictions of the actual values.

As reference to equation 5 indicates the superiority of the augmented Phillips curve is not replicated when a lagged strike volume series is substituted for lagged strike frequency. This finding is consistent with the argument advanced in Chapter 6: namely that, under cooperative incomes policies, wage gains are more likely to be brought about by increases in unofficial action which are most adequately proxied by a strike frequency index.

Table 7.B.1 Determinants of Strike Frequency and Wage Inflation: Belgium 1953-1974

Estimated Coefficients on:

Eqn.	Dep. Variable	C_t	U^{-1}_t	$\dot{U}_t$	$\dot{P}_t$	$\dot{P}^{.2}_t$	$\dot{W}_t$	D_t	F_t	R^2	D-W	'F' Stat	$\bar{S}_t$
1	Strike Frequency	501.13	-4632.10	-1.17		3.06	4.12	-8.78	-61.95	.952	2.08	45.91	100
		(4.48)	(-2.214)	(-4.398)		(1.958)	(1.130)	(-3.596)	(-5.035)			(6,14)	
2	Strike Frequency (Manufacturing)	620.03	-2795.70	-1.07		0.918	-0.43	-12.44	-51.65	.959	2.01	54.79	69
		(8.560)	(-1.619)	(-5.422)		(0.768)	(-0.140)	(-2.87)	(-5.621)			(6,14)	

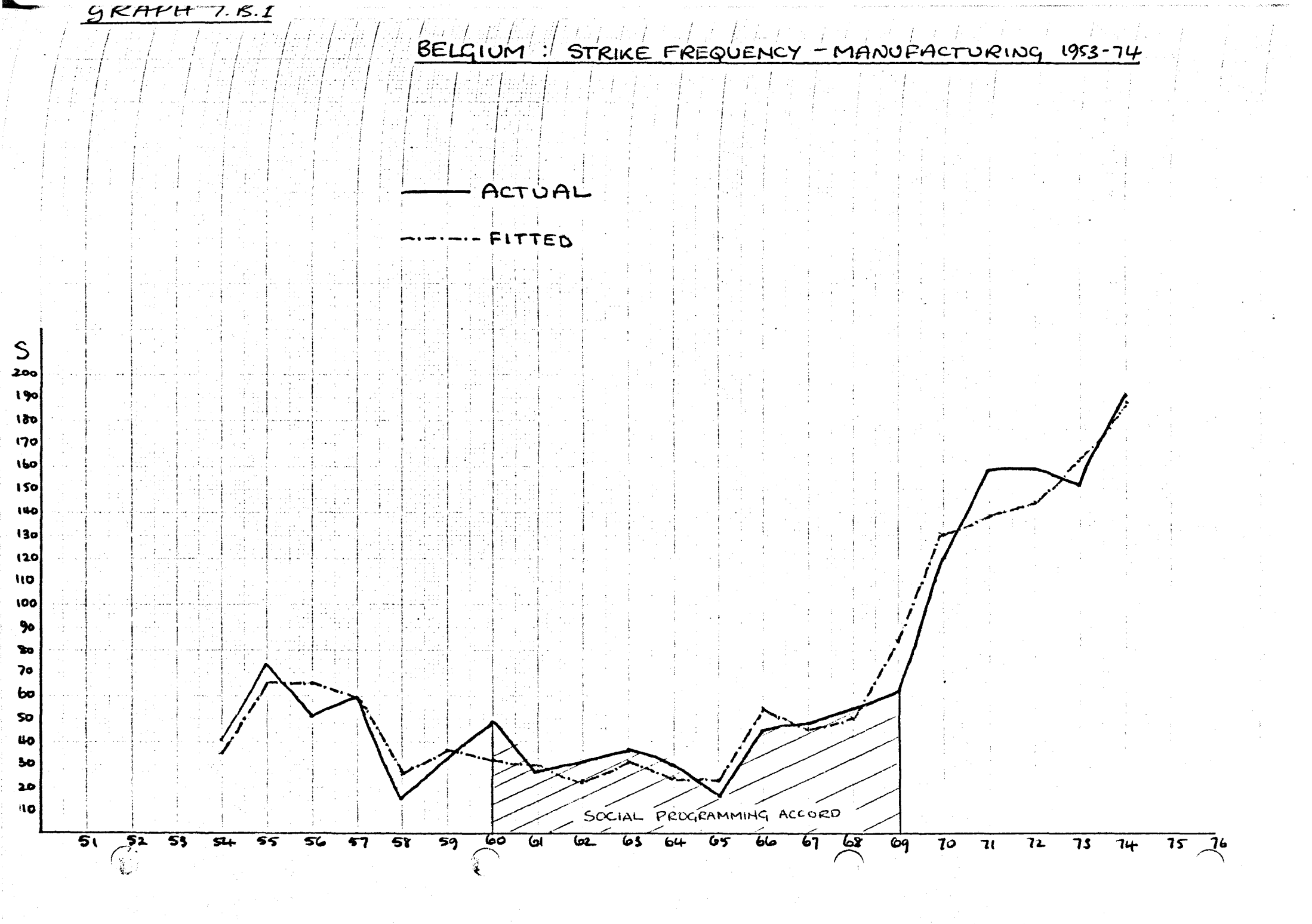
Eqn.	Dep. Variable	C_t	$U^{-1}_{t-1/2}$	$\dot{P}_{t-1/2}$	S_{t-1}	V_{t-1}	R^2	D-W	'F' Stat	$\bar{\dot{W}}$
3	Wage Inflation (hourly rates in manufacturing)	-1.02	401.19	1.679			.904	1.63	84.64	8.5
		(-0.522)	(2.555)	(7.355)					(2,18)	
4	Wage Inflation	-2.92	473.69	1.162	0.040		.939	1.87	87.39	8.5
		(-2.513)	(4.821)	(5.37)	(4.010)				(3,17)	
5	Wage Inflation	-0.654	387.73	1.698		-0.005	.908	1.71	56.06	8.5
		(-0.314)	(2.367)	(7.050)		(-0.909)			(3,17)	

Definitions: C_t is the constant term; all other variables as previously defined; R^2 is the uncorrected correlation coefficient; D-W the Durbin-Watson statistic; 'F' stat is the 'F' statistic; and $\bar{S}$ and $\bar{\dot{W}}$ are the respective means of the dependent variables. The figures in brackets are 't' statistics.

Sources: See Appendix 1

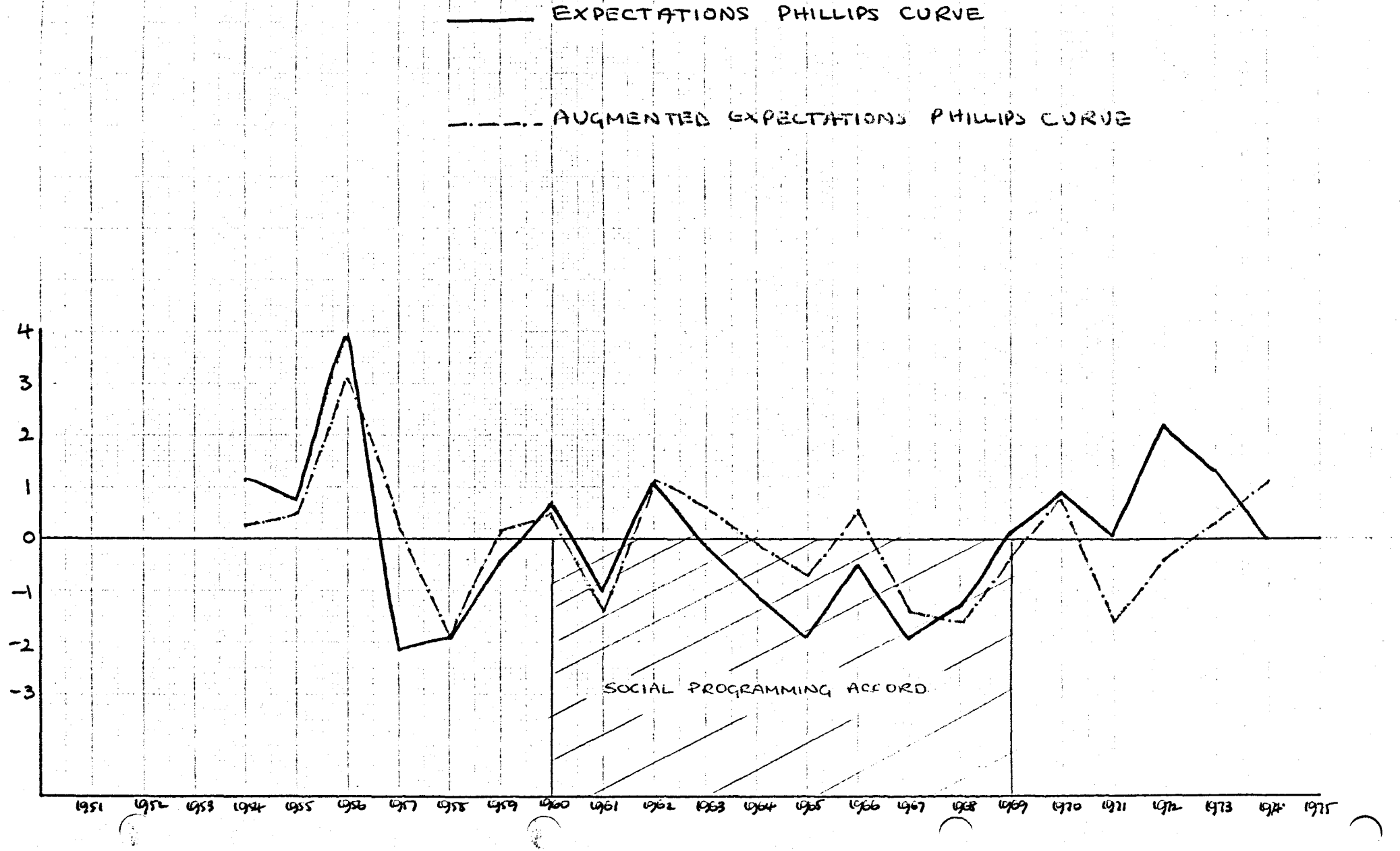
GRAPH 7.B.I

BELGIUM : STRIKE FREQUENCY - MANUFACTURING 1953-74



GRAPH 7.B.2.

BELGIUM - WAGE RESIDUALS 1953 - 1974



Germany

Strike Behaviour

Consistent comparative analysis of strike activity is complicated in the case of Germany by the fact that official statistics on strike frequency are unavailable. Consequently, figures for working days lost (V_t) must be used as a substitute. On the basis of this data the best fitting equation was of the following form: [3]

$$\log V_t = a_0 + a_1 U_t^{-1} + a_2 \frac{\dot{W}}{P_{t-1}} + a_3 D_{t-1} + a_4 \dot{M}_t$$

An important and novel feature of this equation is the inclusion of the rate of change of union density ($\dot{M}_t$) as an additional explanatory variable. As outlined in more detail below, this variable is included in place of dummy variables proxying the effects of 'Concerted Action', which proved insignificant in earlier estimations.[4] A second feature of the equation is its estimation in semi-logarithmic form, a specification which produces results generally superior to those obtained using linear estimation.

As indicated in Table 7.G.1 this equation is able to account for 51% of the variation in strike volume over the period 1953-1975. Examination of the actual and fitted values plotted in Graph 7.G.1 also points to the equation's broad consistency with the strike escalations occurring in Germany in the late 1960's and early 1970 s, although there are signs of underprediction in 1969 and 1973. Significantly, both years follow periods during which there is some evidence of wage restraint.

In terms of the performance of individual variables, all coefficients except that on the profits variable (expressed as a ratio of current aggregate profits to total compensation) appear significant. Specifically, the level of unemployment, expressed as a reciprocal, enters the equation with a negative sign, indicating a positive relationship between unemployment and strike volume. This result, which is consistent with that obtained in Belgium, implies that strikes have historically been used as more of a defensive than as an offensive measure, a conclusion which also gains support from documentary evidence (Bergman and Muller-Jentsch, 1975; p. 273). A positive relationship is also established between strike volume and the real wage variable, a finding which suggests that far from closing the expectations-achievement gap, large past increases may, in the German context, have merely served to stimulate current demands. Re-estimation of the equation using separate wage and price variables also produces a significant positive coefficient on lagged money wages, but produces a significant negative coefficient on the lagged price term. While the latter result is clearly anomalous, it could conceivably be rationalized as consistent with the strong commitment to price stability that has undoubtedly pervaded the Federal Republic (including the unions) during the post-war period - a possible legacy from the Weimar experience. Alternatively, it might be attributed to the low absolute level

of inflation that Germany has experienced over the post-war years. In either event there are strong reasons for doubting the stability of this relationship in the context of more recent strike action, where documentary evidence points to significant reductions in money illusion, and the disappearance of the fixation with price stability 'in favour of wage demands which include factual and prospective price increases as part of their strategy' (Muller-Jentsch and Sperling 1978; p.266).

The last of the significant variables is the rate of change of union density, which enters with a positive sign. The rationale behind the inclusion of this variable is somewhat unusual. As noted above, inclusion of simple one/zero dummy variables representing the operational and breakdown phases of Concerted Action did nothing to improve the explanatory power of the fitted equation. At least on the basis of documentary evidence, however, it is clear that one consequence of Concerted Action was the emergence of significant outbursts of unofficial strike action by a disgruntled rank and file, and declines in union membership in protest against the leaderships' co-option into the policy. These increases in unofficial action were manifest primarily as a significant increase in the number of strikes, a magnitude which, as we have noted, is not officially recorded in Germany. Moreover, given their unofficial nature these strikes were also typically of short duration. Thus, having a much diluted impact on total working days lost, they were only partially reflected in the official strike statistics. Nevertheless, they did have a significant impact on the behaviour of union leaderships. Following the outbursts of unofficial action, union leaders sought to re-restablish control over their rank and file by pursuing more militant action on an offical level; action which was associated with increases in both working days lost and trade union membership. In short, a

positive cyclical relationship was generated between union membership and working days lost based in large part on union leadership's acquiescence in cooperative incomes policies. The significant positive coefficient appearing in equation 1 may therefore be viewed as reflecting this incomes policy effect.[5]

Wage Behaviour

Turning to the area of wages, as noted in Chapter 4, a standard price expectations Phillips curve provides a reasonably good fit to data on changes in weekly wage rates in manufacturing over the period 1953-1975. As can be seen from equation 3 in Table 7.G.1, both unemployment and price terms are significant and correctly signed and 60% of the variation in wage changes is accounted for. Examination of the pattern of residuals generated by equation 3 (see Graph 7.G.2), does, however, reveal a tendency towards overprediction during the periods of wage restraint under Concerted Action (1966-68 - 1971-72) as well as a tendency towards underprediction during the wage escalations of 1969-70 and 1973-74. Supplementing the equation with lagged strike volume in manufacturing does nothing to remedy this problem. As can be seen by reference to equation 4 in Table 7.G.1, the variable is both insignificant and incorrectly signed. In practice, this result is not surprising, since as already noted, strike volume is an inadequate indicator of unofficial action over incomes policy in the German institutional context. In the absence of official strike frequency figures, a third wage equation was therefore specified using contemporaneous changes in union density as a proxy for an incomes policy effect. Thus, in line with the reasoning given above, this variable is interpreted as a delayed militancy index, reflecting union leadership's response to the unofficial protests of the previous period. As equation 5 in Table 7.G.1 indicates, the variable is highly significant and enters with the appropriate positive sign. Moreover, as can be seen from the

Plot of the generated residuals (see graph 7.G.2), the union density augmented equation has significantly improved explanatory power over the period of Concerted Action beginning in 1966. Confirmation of the performance of equation 5 is also presented in Graph 7.G.3 which plots the actual and fitted values generated by this equation.

Table 7.G.1 Determinants of Strike Volume and Wage Inflation: Germany 1953-1975

Estimated Coefficients on:

Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{U}_t$	$\dot{P}_{t-1}$	$\dot{W}_{t-1}$	$\dot{\frac{W}{P}}_{t-1}$	D_{t-1}	$\dot{M}_t$	R^2	D-W	'F' Stat	$\bar{V}_t$
1	Log Strike Volume (Manufacturing)	10.632 (3.140)	-412.68 (-2.399)				0.5265 (3.404)	0.0007 (0.008)	0.446 (2.04)	.506	1.78	4.61 (4,18)	12.14
2	Log Strike Volume (Manufacturing)	15.540 (2.399)	-459.20 (-2.600)		-0.776 (-2.330)	0.519 (3.328)		-0.112 (-0.715)	0.463 (2.051)	.526	1.84	3.77 (5,17)	12.14

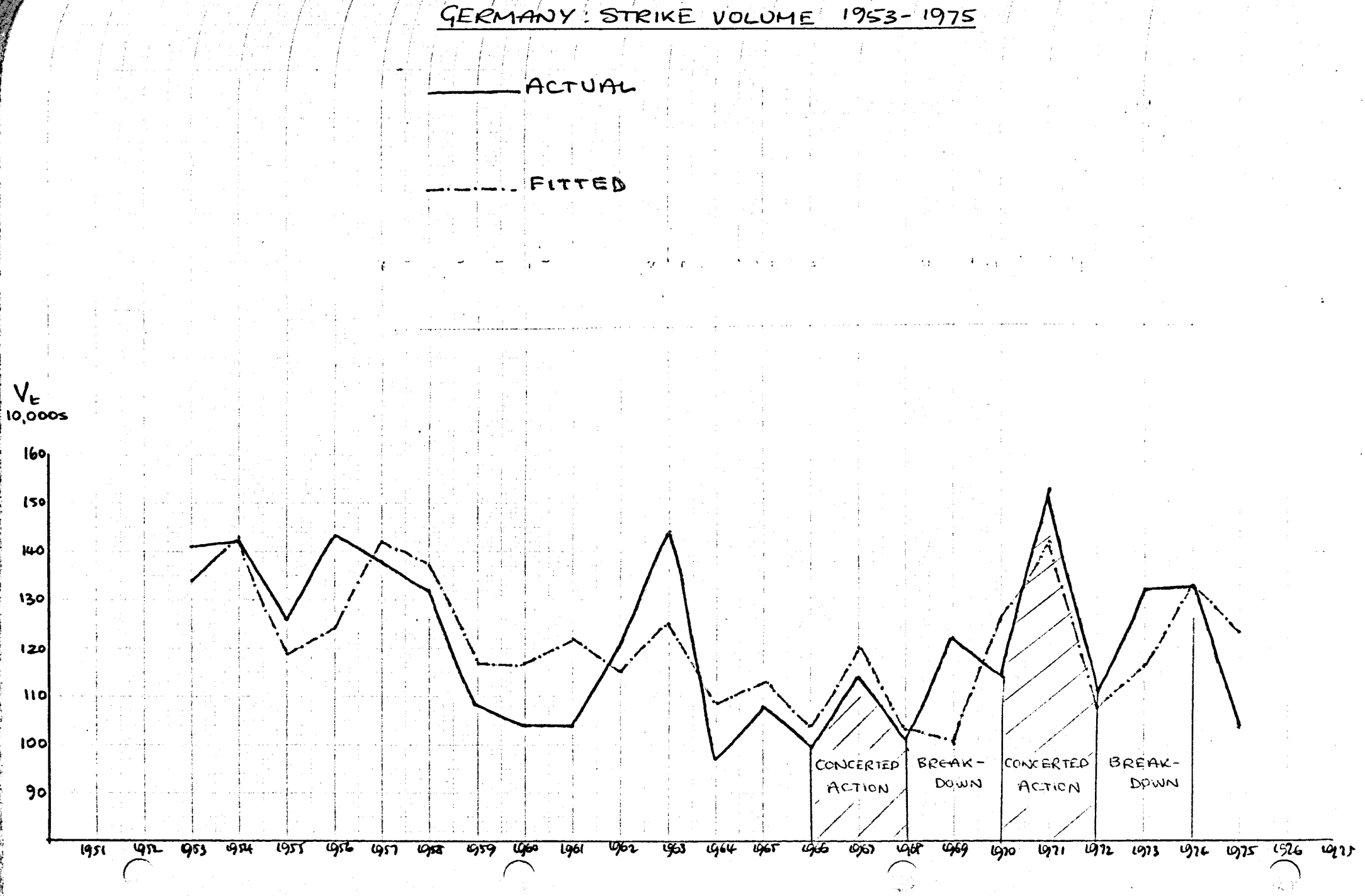
Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{P}_{t-1/2}$	V_{t-1}	$\dot{M}_t$	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
3	Wage Inflation (Weekly rates in Manufacturing)	3.348 (2.302)	927.0 (3.501)	0.562 (2.106)			.613	2.04	15.81 (3,20)	8.43
4	Wage Inflation	2.635 (1.415)	1122.0 (4.161)	0.630 (2.265)	-0.002 (-0.844)		.635	2.13	11.03 (3,19)	8.43
5	Wage Inflation	2.590 (1.239)	1198.0 (5.330)	0.542 (2.299)		0.533 (3.064)	.743	1.88	18.29 (3,19)	8.43

Notes: Figures in brackets are 't' statistics, C_t is the constant term; R^2 the uncorrected correlation coefficient; D-W the Durbin-Watson statistic; 'F' stat the 'F' statistic; and $\bar{V}_t$ and $\bar{\dot{W}}_t$ are the respective means of the dependent variables.

Sources: See Appendix 1

GRAPH 1.9.1

GERMANY: STRIKE VOLUME 1953-1975

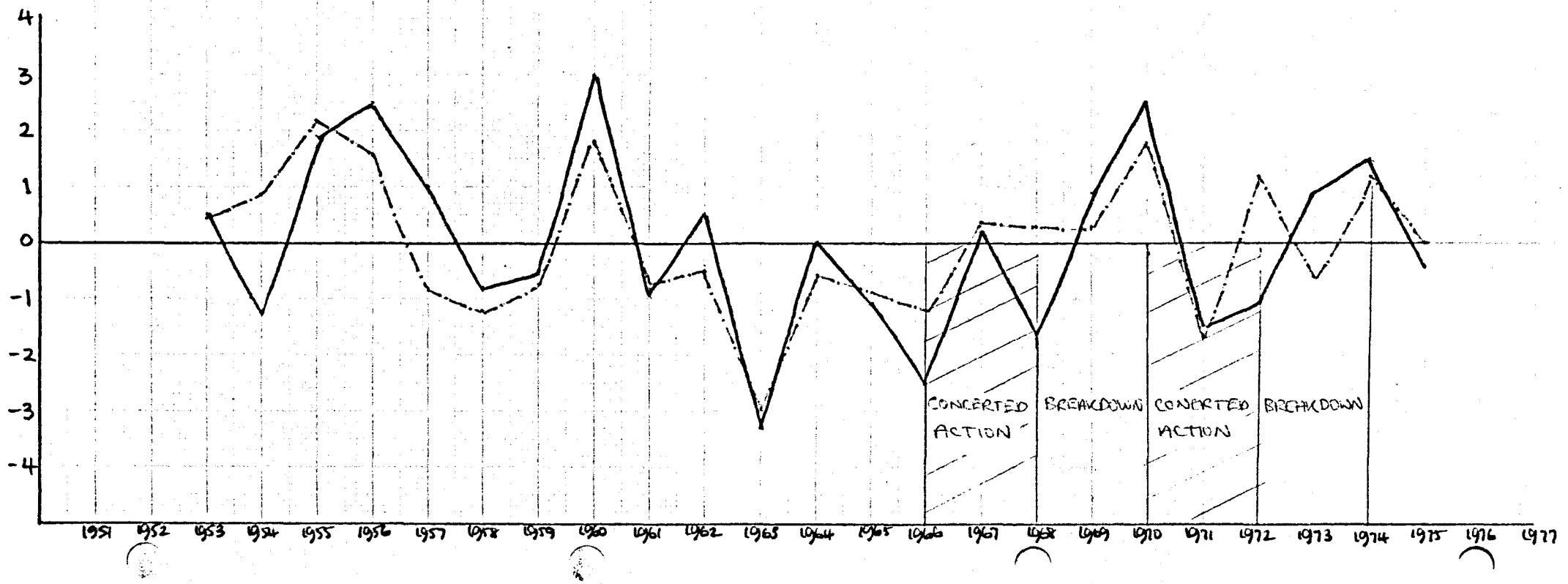


GRAPH 7.9.2.

GERMANY: WAGE RESIDUALS 1953-1975

——— EXPECTATIONS PHILLIPS CURVE

—.—.—. AUGMENTED EXPECTATIONS PHILLIPS CURVE



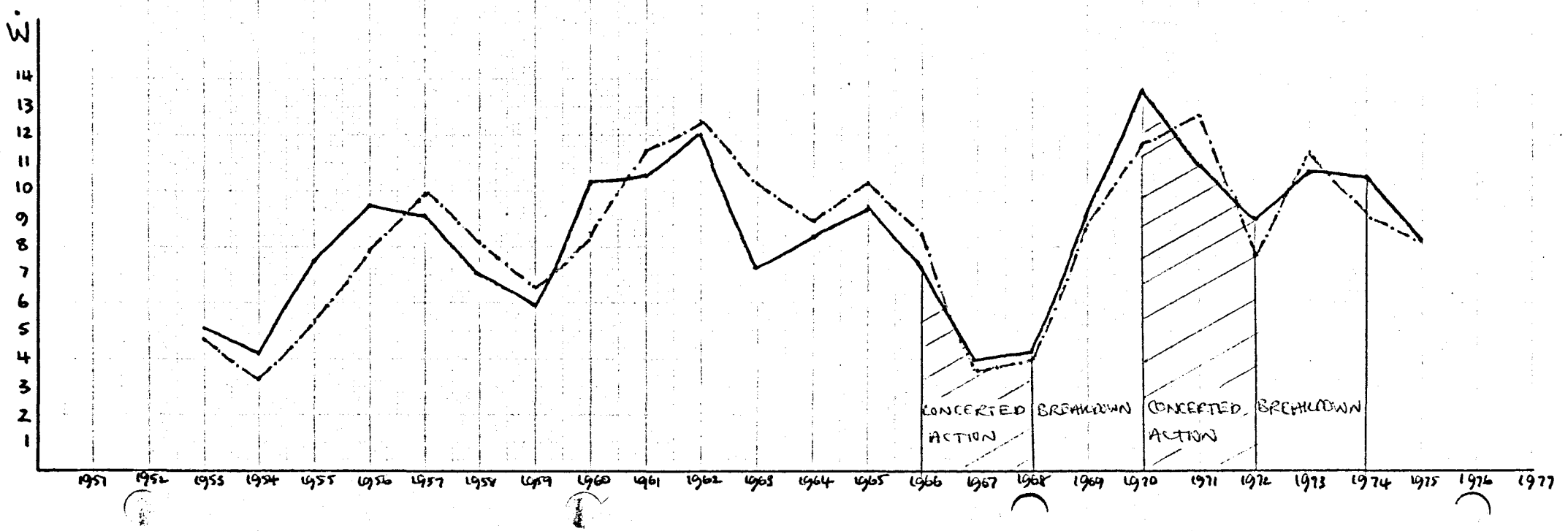
GRAPH 7.9.2.

GERMANY: WAGES IN MANUFACTURING 1953 - 1975

(UNION DENSITY AUGMENTED PHILLIPS CURVE)

——— ACTUAL

-.-.-.- FITTED (EQUATION 5)



NETHERLANDS

Strike Behaviour

In many respects the Netherlands represents one of the most interesting cases in the present sample: a fact which stems from the important changes that have occurred within the Dutch industrial relations systems during the post-war period. From the end of the Second World War until the early 1960's the Netherlands operated a highly centralized system of collective bargaining. Strains began to emerge in this system in the late 1950's, however, and following the final disintegration of the policy in 1962-63, the industrial relations system experienced a significant shift towards more decentralized bargaining at both industry and enterprise levels. To reflect this important structual change, the estimating period for both the strike and wage equations is divided into two sub-periods: namely 1954-62 and 1963-75.

For the earlier sub-period the best fitting strike equation took the following form:[6]

$$\text{Log}S_t = a_0 + a_1 U_t^{-1} + a_2 \dot{U}_t + a_3 \frac{\dot{W}}{P_t} + a_4 D_{t-1}$$

Given that guided wage policy covered the entire estimating period, no separate income policy term is included.

As equation 1 in Table 7.N.1 indicates, while the above equation, specified in semi-logarithmic form, accounts for 77% of the variation in aggregate strike frequency over the period 1954-1962, the value of the "F" statistic is unacceptably low.[7] Nevertheless, in terms of the performance of individual variables, all coefficients are significant with the exception of

that on the lagged profits variable (expressed as the ratio of aggregate profits to total compensation). Specifically, the level of unemployment, expressed in reciprocal form, enters the equation with a significant negative sign, implying a positive relationship between strikes and unemployment. By contrast, the rate of change of unemployment appears inversely related to strike frequency, implying increased strike action as unemployment falls. Both findings are consistent with those obtained for Belgium, and may again be explained as deriving from the combined effects of a centralized bargaining structure (which allows employers to grant discretionary supplements at plant level during periods of labour market tightness, and remove them during periods of slack), and a central wage policy under which union leaders forego the full exploitation of their labour market power when unemployment is low. Finally, in terms of real wage changes, a negative coefficient is obtained, a finding broadly consistent with the conventional assumption that large real increases will serve to reduce the size of the expectations-achievement gap.

For the later period, the best fitting strike equation took the following form:[8]

$$\text{Log}S_t = a_0 + a_1 U_t^{-1} + a_2 \frac{\dot{W}}{P_t} + a_3 D_{t-1} + a_4 F_t$$

The additional variable, F_t, is a simple one/zero dummy proxying the effects of a breakdown in wages policy.[9] Also specified in semi-logorithmic form, this equation (equation 2 in Table 7.N.1) accounts for 93% of the variation in aggregate strike frequency over the period 1963-1975; moreover, in this case, reference to the 'F' statistic shows this result to be highly significant. The equation's overall explanatory power is also confirmed by

reference to Graph 7.N.1 which contains plots of the actual and fitted values for log strike frequency over the period.

In terms of the performance of individual variables, while all coefficients are significant, several important contrasts are evident with the findings reported for the earlier period. The most significant of these is undoubtedly the relationship between strikes and the level of unemployment, which takes on a conventional inverse form in equation 2. Thus, it appears that the demise of the guided wage policy, and the shift towards more decentralized bargaining were also associated with a shift from a predominantly defensive form of strike action during periods of high unemployment, towards a more offensive form of action during periods of low unemployment. This development is clearly consistent with a greater willingness on the part of organized labour to exploit more fully its collective bargaining advantage following the demise of guided wage policy.

A second major contrast between the two sub-periods appears in relation to the profits variable, which while retaining its negative sign, becomes significant in the later period. This is consistent with a greater net influence for employer ability to pay and/or higher opportunity costs of striking in reducing the frequency of stoppages during periods of high profits.

With respect to the remaining variables; the real wage term again enters the equation with a significant negative sign. Also in this connection, re-estimation of the equation with separate money wage and price terms (as in equation 3) confirms their individual significance, with the latter variable entering with the expected positive coefficient, and the former with a significant negative coefficient. Finally, the post income restraint dummy enters the equation with a significant positive sign, confirming the existence

of increased industrial unrest following the demise of wages policy. Reference to equation 4 in Table 7.N.1 also suggests that these results are not significantly altered by the use of strike frequency in manufacturing as the dependent variable in place of aggregate strike frequency.

Wage Behaviour.

Important contrasts between the two sub-periods identified above are also apparent in the context of wage determination. Nevertheless, as noted in Chapter 4 and illustrated again in equation 5 in Table 7.N.1, a conventional price expectations Phillips curve fitted for the entire period 1953-1977 is still capable of providing a reasonably good explanation of changes in hourly wage rates in manufacturing industry. In fact, the fitted equation explains 65% of the variation in the latter variable, with both the unemployment and price variables significant and correctly signed. Examination of the pattern of residuals plotted in graph 7.N.2 does, however, reveal the equation's poor predictive performance prior to 1963, as well as its inability to explain either the wage escalations of 1964 and 1971, or the level of settlements emerging during the government's unilaterally imposed wage policy of 1966-67. Moreover, as equations 6 and 7 in Table 7.N.1 clearly illustrate, supplementing the basic equation with either lagged strike frequency in manufacturing, or lagged strike volume in manufacturing, does little to remedy this situation.

Considerably greater light is shed on the pattern of wage changes in the Dutch context when separate equations are estimated for the sub-periods 1954-1962 and 1963-1975. As equation 8 indicates, during the earlier period of centralized wage policy wage changes were largely insulated from market forces, with neither unemployment nor price changes reaching acceptable levels of significance. With the breakdown of the centralized policy, and the

development of more decentralized bargaining, this situation changed substantially. As equation 9 illustrates, during the period 1964-1975 both unemployment and price changes are significant predictors of wage changes, accounting for 78% of the variation in the latter variable. Again, however, as Graph 7.N.3 indicates, this basic expectations Phillips curve is unable to account fully either for the wage escalations of 1964 and 1971, or for the depressed level of settlements in 1966-1967. This deficiency is at least partly remedied by the inclusion of a lagged manufacturing strike frequency variable (as can be seen in the plot of the residuals from this augmented equation in Graph 7.N.3). However, while reference to equation 10 in Table 7.N.1 indicates that the lagged strike variable enters the augmented equation with a highly significant positive sign, it is also apparent that this success is achieved partly at the expense of the unemployment variable,[10] as well as involving a decline in the value of the 'F' statistic. Finally, in line with a priori expectations, it appears from equation 11 that the substitution of lagged strike volume in manufacturing for strike frequency makes no significant contribution to the performance of the basic expectations Phillips curve over the period 1963-74.

Table 7.N.1 Determinants of Strike Frequency and Wage Inflation: The Netherlands 1954-1975

Estimated Coefficients on:

Eqn.	Dep. Variable	C	U_{t-1}	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	$\dot{W}_t - \dot{P}_t$	D_{t-1}	F_t	R^2	D-W	'F' Stat	Log S_t
1	Log Strike Frequency (1954-1962)	11.66 (2.000)	-63.63 (-2.150)	-0.024 (-2.140)			-0.207 (-2.214)	-0.001 (-1.095)		.771	2.26	3.37 (4,4)	4.06
2	Log Strike Frequency (1963-1975)	7.246 (3.292)	208.88 (5.54)				-0.339 (-3.76)	-0.002 (-2.46)	2.140 (5.584)	.930	1.36	23.07 (4,7)	2.98
3	Log Strike Frequency (1963-1975)	11.738 (2.901)	247.90 (5.261)		0.297 (2.870)	-0.395 (-3.960)		-0.003 (-2.570)	2.028 (5.050)	.944	1.43	20.22 (5,6)	2.98
4	Log Strike Frequency in Manufacturing (1963-1975)	19.535 (3.962)	380.28 (6.113)		0.471 (3.178)	-0.685 (-4.45)		-0.006 (-3.888)	2.611 (4.990)	.938	2.89	18.00 (5,6)	2.21

Cont'd.

Table 7.N.1 Continuation *Determinants of Strike Frequency and Wage Inflation: The Netherlands 1954-1975*

Estimated Coefficients on:

Eqn.	Dep. Variable	C t	U^{-1}_{t}	$\dot{P}_{t-1/2}$	S_{t-1}	V_{t-1}	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
5	Wage Inflation (1954-1975)	0.0116 (0.009)	210.04 (4.710)	1.133 (7.470)			.649	2.14	17.64 (2,19)	8.92
6	Wage Inflation (1954-1975)	0.328 (0.197)	213.26 (4.580)	1.097 (5.770)	-0.006 (-0.320)		.651	2.18	11.23 (3,18)	8.92
7	Wage Inflation (1954-1975)	0.0471 (0.035)	210.00 (4.660)	1.167 (7.350)		-0.024 (-0.815)	.662	2.21	11.77 (3,18)	8.92
8	Wage Inflation (1954-1962)	2.45 (0.833)	158.10 (1.240)	0.564 (0.699)			.429	2.39	2.25 (2,6)	6.95
9	Wage Inflation (1963-1975)	-0.172 (-0.101)	247.40 (6.085)	1.089 (5.627)			.779	1.44	15.86 (2,9)	10.51
10	Wage Inflation (1963-1975)	0.804 (0.342)	129.50 (1.753)	0.964 (3.644)	0.084 (3.776)		.838	1.41	9.40 (3,8)	10.51
11	Wage Inflation (1963-1975)	-0.164 (-0.083)	247.40 (5.737)	1.087 (4.042)		0.0004 (0.0108)	.779	1.44	9.40 (3,8)	10.51

Notes: Figures in brackets are 't' statistics
All variables are as previously defined

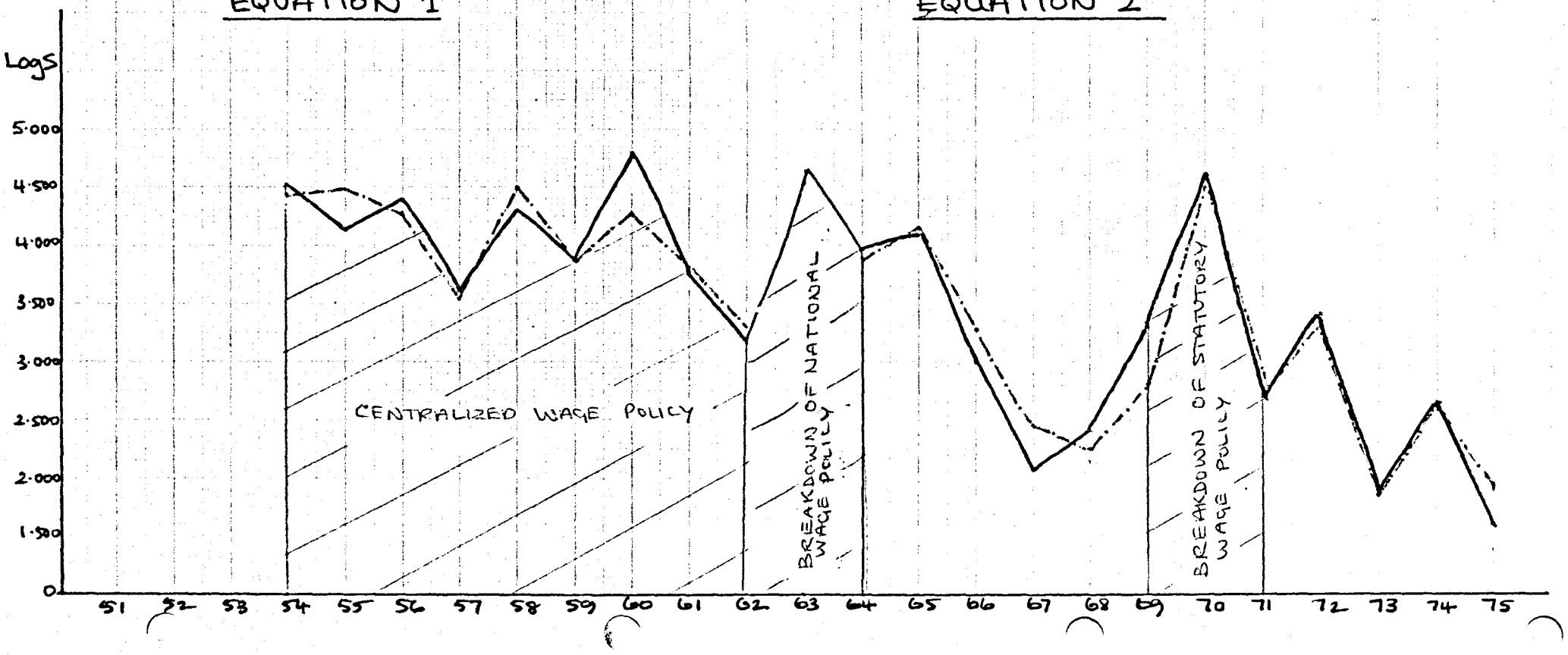
Sources: See Appendix 1

GRAPH 7.N.1

NETHERLANDS: LOG STRIKE FREQUENCY 1954-62 1963-75

——— ACTUAL VALUES

-.-.-.- FITTED VALUES

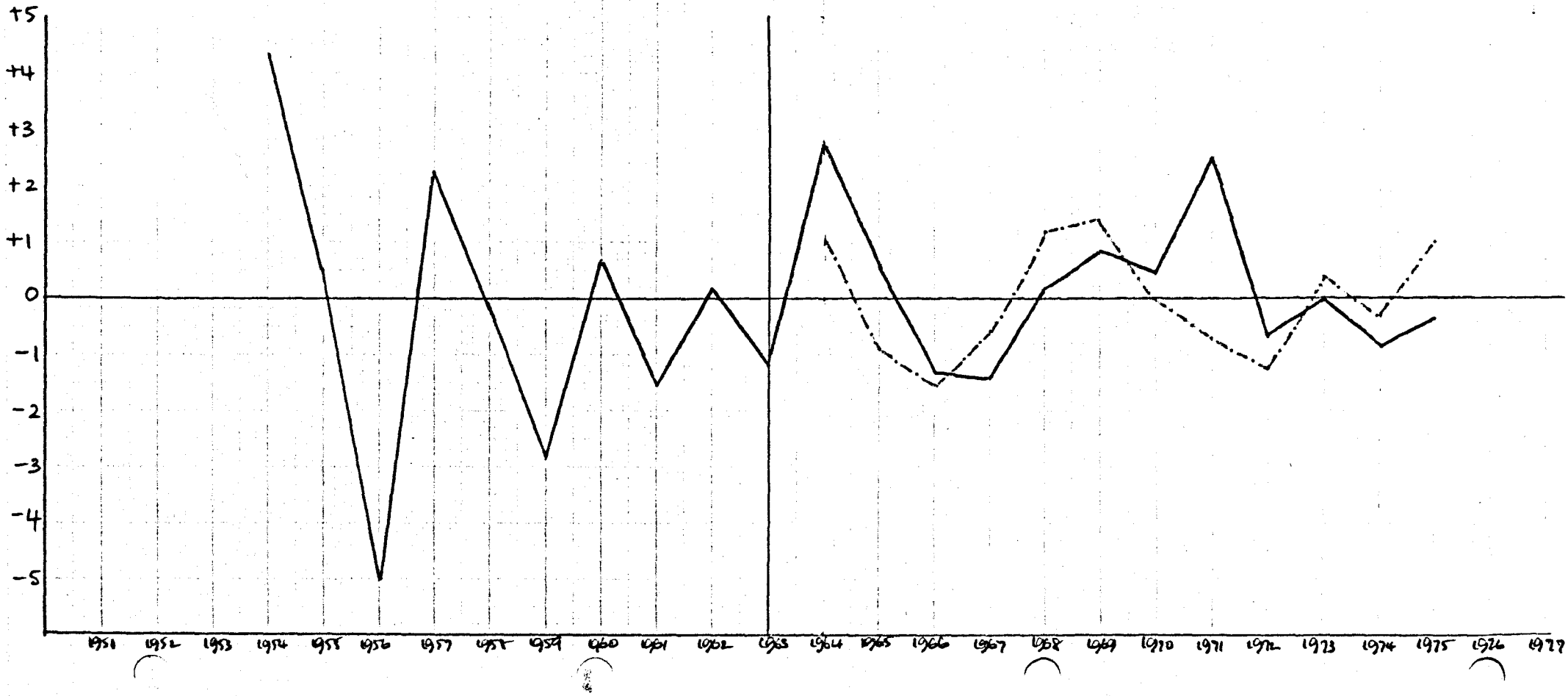


GRAPH 7. N.2

NETHERLANDS : WAGE RESIDUALS 1954-62; 1963-75

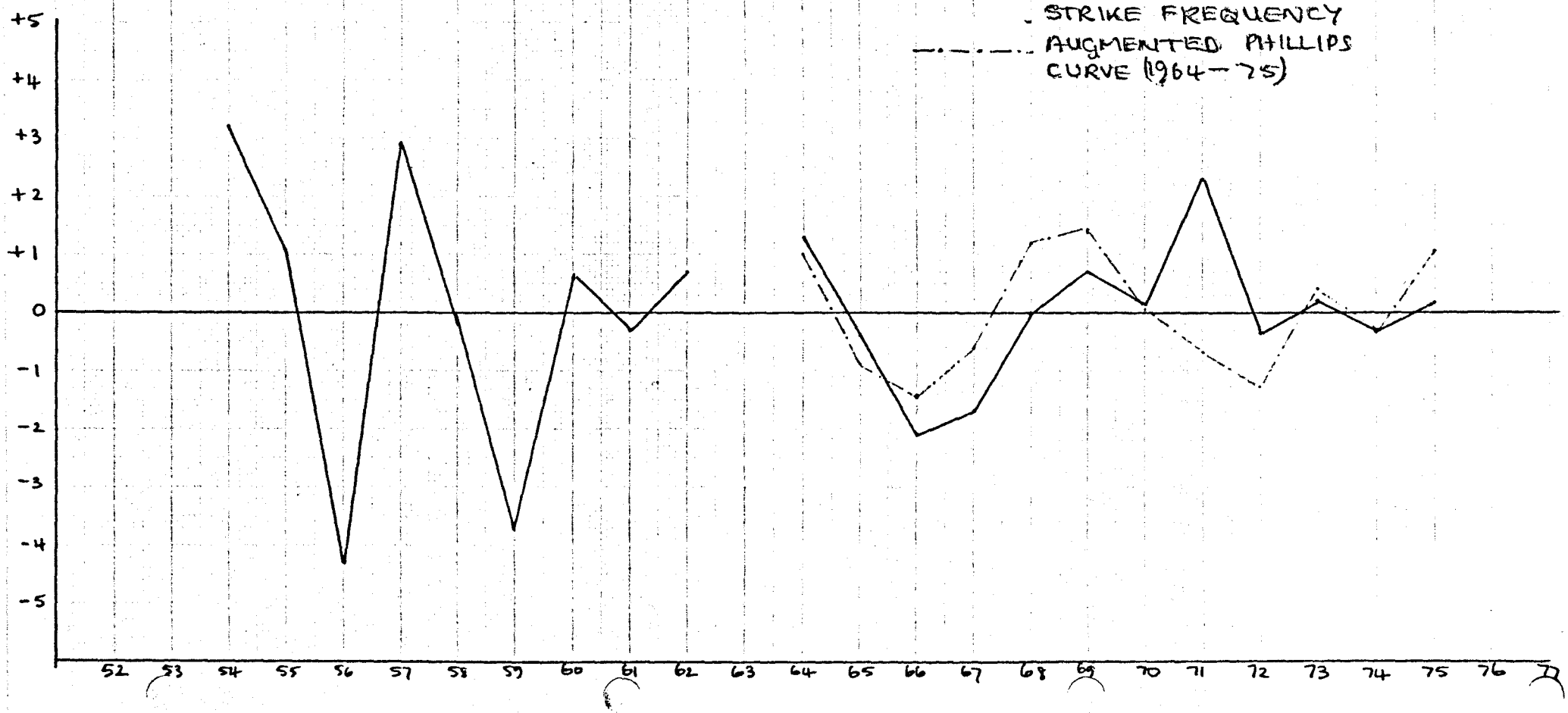
——— EXPECTATIONS PHILLIPS CURVE (1954 – 1975)

–.–.–.– AUGMENTED EXPECTATIONS PHILLIPS CURVE (1963-1975)



GRAPH 7.N.3

NETHERLANDS: WAGE RESIDUALS 1954-62; 1964-75



SWEDEN

Strike behaviour

In the Swedish context the best fitting equation took the following form:[11]

$$S_t = a_0 + a_1 U_t^{-1} + a_2 \dot{U}_t + a_3 \dot{P}_t^2 + a_4 \dot{W}_t + a_5 D_{t-1} + a_6 F_t$$

The dummy variable F_t is included to control for the strike wave occurring in 1970, following a period of increasing strain in the industrial relations arena over the operation of the Solidarity Wage Policy.

As can be seen from equation 1 in Table 7.S.1, estimation produces a fitted equation which explains 86% of the variation occurring in strike frequency over the period 1953-1977. Moreover, reference to the actual and fitted values plotted in Graph 7.S.1 also shows the equation to be a satisfactory predictor of the strike waves occurring in Sweden in the early and mid 1970s.

In terms of the performance of individual variables, all coefficients except that on lagged profits (measured as the ratio of aggregate profits to total compensation) are significant. Specifically, a significant positive relationship is established between strike frequency and the level of unemployment, while a significant negative relationship is established with the rate of change of unemployment. Thus, as in Belgium, and the Netherlands prior to the demise of the central wage policy, strike frequency is increased during periods of high unemployment, and during periods of falling unemployment. As argued previously, this result may be attributed to the combined effects of a centralized bargaining structure, and a leadership commitment to restraint in the pursuit of gains during periods of labour market tightness.

With respect to inflation, the non-significance of a simple price change variable in earlier estimations prompted experimentation with a quadratic specification. When specified in this form the variable enters the equation with a highly significant positive coefficient, indicating strike sensitivity to higher levels of inflation.

In terms of the effects of wage changes on strikes, equation 1 points to the existence of a significant positive relationship between these variables. This clearly runs counter to the predictions of an expectations-achievement gap interpretation of the type hypothesized in the Ashenfelter-Johnson model (1969), lending support instead to an interpretation based upon a commitment to the maintenance of wage structure and the pattern of differentials. Indeed, in the Swedish context, such a commitment has been of particular significance in the case of white collar workers and professionals, who have become increasingly concerned over the erosion of differentials consequent upon the LO's pursuit of the Solidarity Wage Policy, as well as over the erosion of their disposable income in the face of a highly progressive tax system. Thus, while the separate tax variable appeared statistically insignificant in preliminary estimations, a tax effect may still have been an important contributor to industrial unrest through a process in which high settlements combined with high marginal tax rates to produce frustrated wage expectations. In addition, attention should probably also be drawn to the impact of the mining sector where, as in Belgium, declines in the relative wage position vis à vis manufacturing industry were associated with significant increases in worker protest, despite the depressed state of the industry.[12]

Finally, turning to the last of the significant variables, the strike wave/post-restraint dummy variable enters equation 1 with a significant

positive sign, reflecting the escalations in both unofficial blue collar, and official white collar protest that emerged in 1970 over the operation of the Solidarity Wage Policy.

Wage Behaviour

In the context of wage determination, as noted in Chapter 4, a simple price expectations Phillips curve provides a poor explanation of changes in hourly wage rates in manufacturing in Sweden over the period 1953-77. As can be seen from equation 2 in Table 7.S.1, only 39% of the variation in the dependent variable is accounted for; while the unemployment rate, though correctly signed, is insignificant. In addition, the coefficient on the price term suggests the presence of substantial money illusion.

Inclusion of a lagged strike frequency variable produces a worthwhile improvement in this performance. As equation 3 illustrates, not only is the lagged strike variable significant and correctly signed, but its inclusion also brings about a significant improvement in the performance of the unemployment variable. An even more dramatic improvement in the equation's performance is achieved by the substitution of a lagged strike volume index in place of strike frequency. As can be seen from equation 4, the new variable is highly significant and correctly signed, and 75% of the variation in the wage variable is successfully explained. Further confirmation of the superiority of this equation over equation 2 is provided in Graph 7.S.2, which plots the residuals generated by the two equations; while evidence of its overall predictive power is presented in Graph 7.S.3,which plots the fitted values produced by the equation against the actual wage series.

Though equation 4 is clearly the most satisfactory of the three wage equations, its success does appear to contradict the argument advanced earlier

that under cooperative incomes policies wage gains are more likely to be brought about by unofficial action, which, in turn, is most adequately proxied by strike frequency rather than strike volume. An important qualification must be made to this argument in the Swedish context, however. In particular, Sweden's Solidarity Wage policy was operated primarily at the instigation of the blue-collar L.O. Unions, with only grudging acquiescence from the white-collar unions T.C.O. and S.A.C.O. Indeed, as noted earlier, over time the latter organizations became increasingly concerned at the progressive erosion of economy-wide differentials which the policy produced. As a result, when the protests against the solidarity policy surfaced in the major strike escalations of the early 1970's, they were to a much larger extent than elsewhere based upon official - and notably white-collar - action, and therefore had a significant and immediate impact on total working days lost. Thus, in the Swedish context, the latter variable is also a satisfactory index of trade union discontent over wage restraint.

On the basis of the results presented in Table 7.5.1., one may clearly conclude that Swedish unions have had a significant autonomous impact on the pace of wage change over the period under consideration. Indeed, as further confirmation of this, reference might be made to the significant reduction in the size of the constant term brought about by the addition of the strike volume index (from 6.75 in equation 2 to 1.83 in equation 5); a reduction associated with the augmented equation's ability to 'explain' a substantial element of wage change accounted for in equation 2 simply as autonomous wage-push. This should not be taken to imply that trade union action has always been associated with an upward displacement of the Phillips curve, since between 1955 and 1964 such action is apparently associated with its downward displacement. However, where upward wage pressure from unions is evident, it would appear that tight labour markets have not been a necessary precondition. Thus, as Calmfors (1977) has

argued:

> "Because of the political priority given to the goal of full employment, trade unions may . . . expect the necessary validation of cost push increases to be forthcoming through an endogenously determined economic policy. This should especially be the case after long periods of successful employment policy such as that of the 1960s in Sweden, which probably weakened the 'unemployment ghost' as a factor restraining trade unions"
>
> (Calmfors 1977; pp. 518-519)

This argument is clearly consistent with both the increase in the significance of the unemployment variable between equations 2 and 4, and with the positive relationship between strikes and unemployment depicted in equation 1.

Table 7.S.1 Determinants of Strike Frequency and Wage Inflation: Sweden 1953-1977

Estimated Coefficients on:

Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{U}_t$	$P_t^{.2}$	$\dot{W}_t$	D_{t-1}	F_t	R^2	D-W	'F' Stat	S_t
1	Strike Frequency	36.78 (1.486)	-6164.8 (-3.836)	-1.41 (-2.073)	0.345 (3.426)	2.54 (2.274)	-0.0161 (-0.287)	87.43 (6.136)	.862	1.93	18.71 (6,18)	35.4

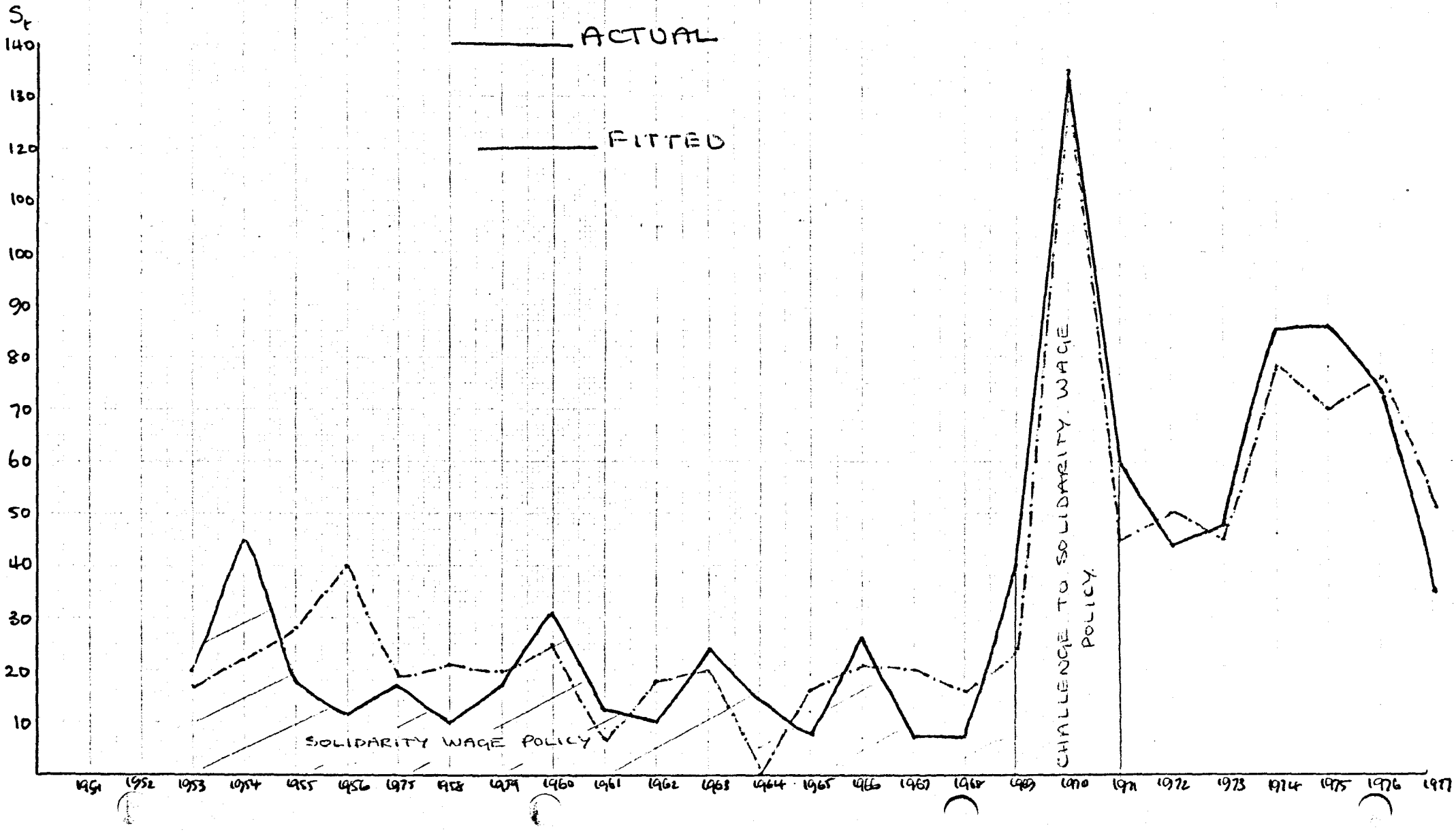
Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{P}_{t-1/2}$	V_{t-1}	S_{t-1}	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
2	Wage Inflation (hourly rates in manufacturing)	6.751 (3.642)	18.18 (0.594)	0.309 (4.456)			.389	2.06	7.012 (2,22)	8.62
4	Wage Inflation	4.010 (2.476)	41.46 (1.750)	0.196 (2.96)		0.0512[1] (3.189)	.564	2.33	9.05 (3,21)	8.62
5	Wage Inflation	1.826 (1.352)	75.73 (3.805)	0.368 (9.235)	0.0115[2] (5.757)		.750	2.07	21.02 (3,21)	8.62

Notes: [1] Aggregate strike frequency
[2] Aggregate strike volume
Figures in brackets are 't' statistics
All variables as previously defined

Sources: See Appendix 1

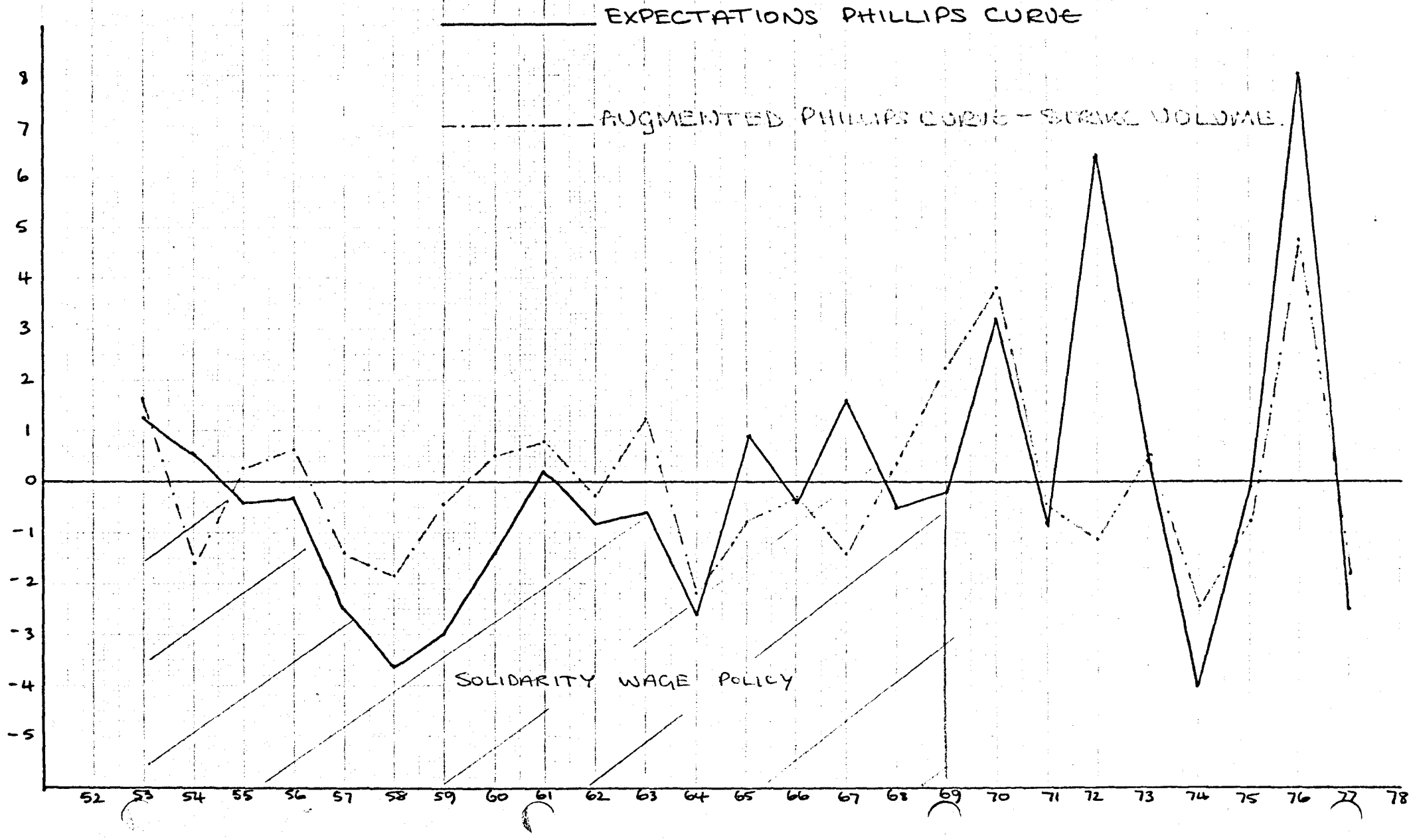
GRAPH 7.S.1

SWEDEN: STRIKE FREQUENCY 1953-1977



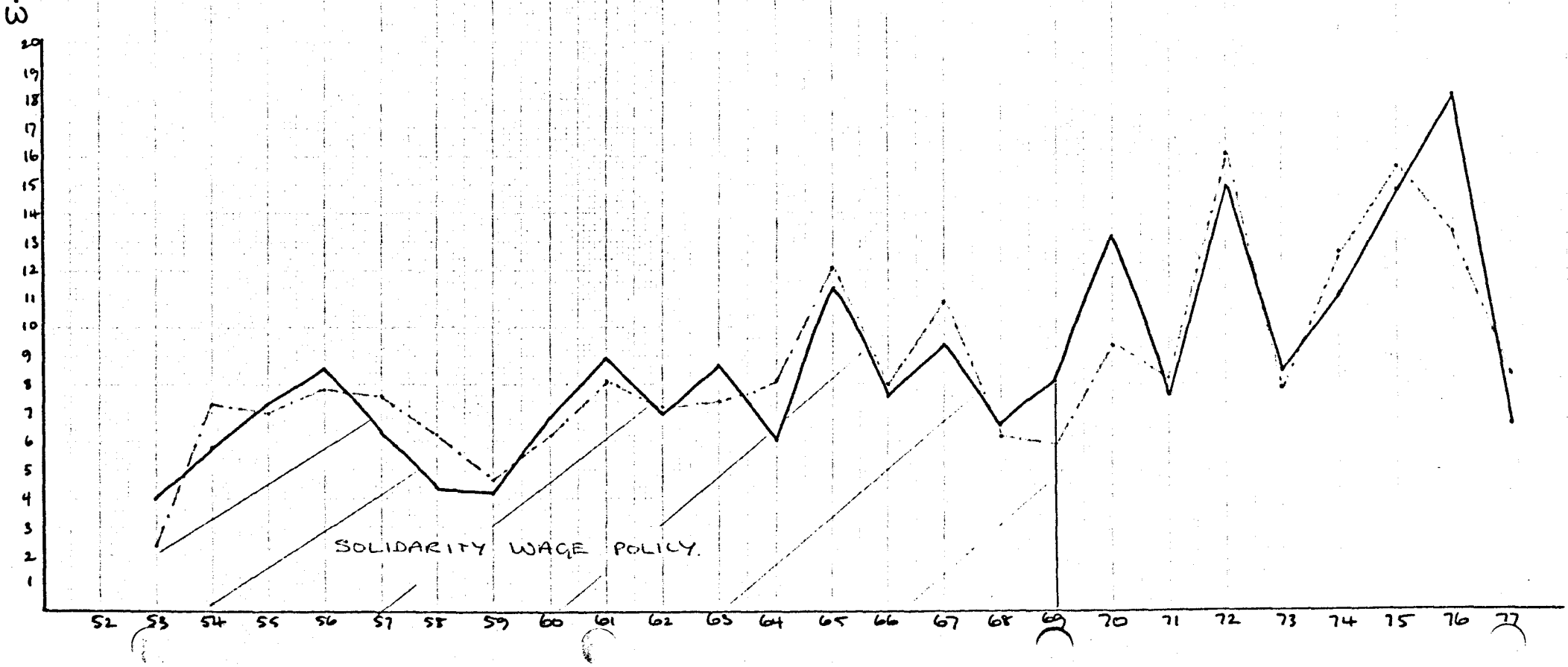
GRAPH 7.S.2

SWEDEN: WAGE RESIDUALS 1953-1977



GRAPH 7.S.3.

SWEDEN: WAGES IN MANUFACTURING 1953-1977



FRANCE

Strike Behaviour

Previous empirical work on French strike activity has not been supportive of the notion that they are responsive to economic factors (Shorter and Tilly 1974; Snyder 1975). Rather, French strikes have been viewed as essentially political phenomenon, more responsive to variations in organizational factors and changes in the constellation of forces in the political arena than to changes in economic conditions. This contention is not, however, confirmed by the findings of the present research, which suggests that at least over the period 1956-1976 (excluding the strike explosion of 1968)[13], French strike frequency was broadly responsive to such factors as the state of the labour market, the profit share (measured as the ratio of aggregate profits to total compensation) and to some extent also real wages.

The best fitting equation in the French context took the following form:[14]

$$S_t = a_0 + a_1 V_t + a_2 \frac{\dot{W}}{P}_t + a_3 D_t$$

Where the dependent variable S_t is an all-industry strike frequency series; V_t is the level of unfilled vacancies(which proved a better proxy for labour market conditions than the level of unemployment in preliminary estimations) and, as previously, $\frac{\dot{W}}{P}_t$ and D_t are the current change in real wages, and a profit variable respectively.

As indicated by equation 1 in Table 7.F.1, 81% of the variation in strike frequency over the period 1956-67 and 1969-76 is explained. A further indication of the equation's overall explanatory power is provided in Graph 7.F.1, which contains plots of the fitted values generated by the equation, together with the actual values of strike frequency over the estimation period. Though clearly not the sole determinant of aggregate fluctuations in strike frequency in France, it is clear that economic conditions are still of considerable significance.[15]

In terms of the performance of individual variables, the vacancy rate enters the equation with a significant positive sign, a finding consistent with increased union aggressiveness during periods of labour market tightness. The profits variable also appears highly significant, and enters with a negative sign, suggesting on balance a greater employer willingness to concede when profits are high. In actual fact, in the context of a politically oriented labour movement, this is not intuitively the most likely outcome. On a priori grounds it would seem reasonable to suppose that union movements with macro political objectives would be vigorous defenders of labour's income share. Finally, the real wage variable enters with an insignificant negative sign.

One variable not included in equation 1, but which nevertheless warrants some discussion, is incomes policy. As noted in Chapter 6, th ough attempts to introduce an overall system of wage restraint in 1964 through concertation were unsuccessful, the operation of the Toutée procedure had some effect in promoting restraint in the public sector between 1964 and 1967. Moreover, it has been argued (Soskice 1978), that the discriminatory impact of this policy between public and private sectors was responsible, at least in part, for both the wage and strike explosions of 1968. Thus, on the one hand the greatest

wage increases of 1968 were apparently concentrated among those public employees who had been subject to the most determined restraint (Ulman and Flanagan 1971), while on the other, there is evidence that the early strikes of May 1968 were also concentrated in the public sector (Goldey 1970). Regardless of how compelling such documentary evidence for an incomes policy effect in the French context may be, the empirical estimation of its precise magnitude remains problematical. First, the strike data reported to the International Labour Office (and utilized here)[16] is confined, at least in the case of France, to strikes in the industrial sector, and thus excludes strikes occurring in the public sector. Second, official statistics on the extent of the 1968 strike wave are lacking - a fact which also accounts for the exclusion of 1968 from the estimating equation.

Wage Behaviour.

Turning to the pattern of wage changes, reference to equation 2 in Table 7.F.1 indicates that a basic price expectations Phillips curve is able to account for 83% of the variation in changes in weekly wage rates in manufacturing over the period 1956-1976 (again excluding 1968). Both the labour market (as proxied by the level of unfilled vacancies) and price variables are significant and correctly signed. Examination of the pattern of residuals plotted in Graph 7.F.2 indicates the good overall performance of the equation, though its explanatory power does show some deterioration from 1972 onwards. In addition, there is some evidence of systematic over-prediction of the actual rate of wage inflation in manufacturing during the period of public sector wage restraint, though its magnitude is not large. Nevertheless its occurrence is consistent with the operation of some form of public/private sector demonstration effect with respect to wage determination.

Despite the generally satisfactory performance of equation 2, by way of experimentation it was re-estimated first with the addition of lagged (all industry) strike frequency, and then with the corresponding lagged strike volume series. The results are reported in equations 3 and 4 in Table 7.F.1. As can be seen, both strike variables enter the equation with significant positive signs - a finding consistent with the argument that strike activity in France has been associated with an upward displacement of the pace of wage change. It is also evident from equations 3 and 4, however, that the addition of these strike variables is associated with a decline in the value of the 'F' statistics as well as in the significance of unfilled vacancies[17]. Furthermore, in the French context, the inclusion of the strike variables cannot be justified via recourse to the argument presented in Chapter 6 in relation to the effects of cooperative incomes policy. In view of this, equation 2 must be the preferred equation; and the most appropriate conclusion would seem to be that while French unions have been able to achieve significant increases in nominal wages as a result of autonomous pressure on certain specific occasions (as in 1968 for example), they have been unable to achieve this result on a sustained or continuous basis. Indeed in 1969, the year following the wage explosion associated with the May/June strike outbursts, the rate of increase in real wages was the lowest for a decade. Also of significance is the fact that labour's share in national income remained unchanged between 1963 and 1971. On the basis of such evidence it is difficult to quarrel with Salin and Lane's (1977) assessment that:

> ". . . real wages cannot be determined autonomously, except in the special social and political conditions characteristic of 1968 when the government both accepted an exceptional increase in wages and adopted a very liberal credit policy - or when, maybe, everyone took it for granted that monetary and credit policy was very expansionary"
>
> (P. Salin and G. Lane 1977; pp. 574)

Table 7.F.1 The Determinants of All-Industry Strike Frequency and Wage Inflation in Manufacturing: France 1956-67; 1969-76

Estimated Coefficients on:

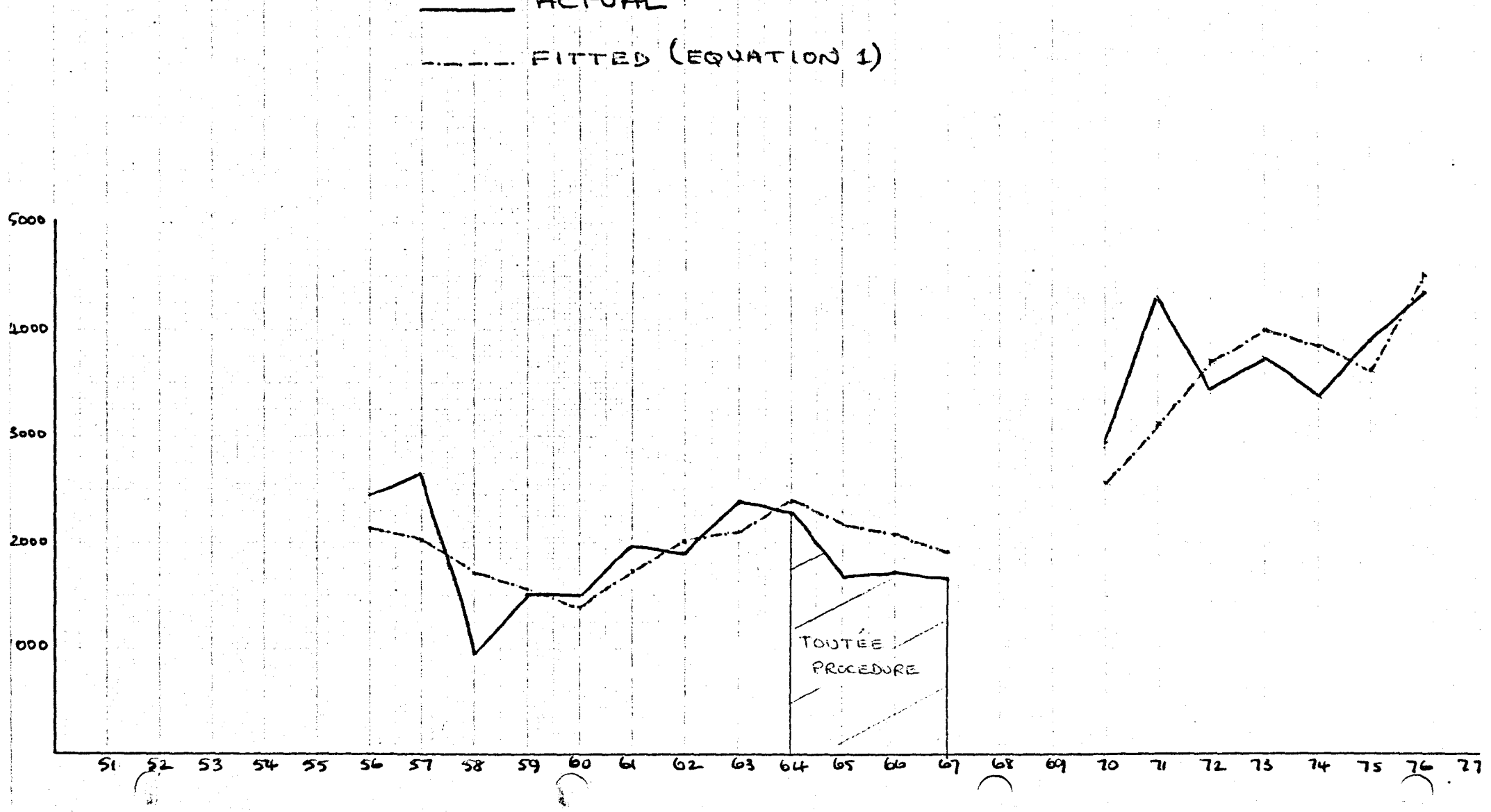
Eqn.	Dep. Variable	C_t	V_t	$\frac{\dot{W}}{P_t}$	D_t		R^2	D-W	'F' Stat	$\bar{S}_t$
1	Strike Frequency (All Industry)	9010.9 (4.240)	6.489 (2.226)	-0.392 (-1.310)	-17.780 (-3.340)		.810	1.88	21.38 (3,15)	2560
Eqn.	**Dep. Variable**	C_t	V_t	$\dot{P}_{t-1/2}$	S_{t-1}	SV_{t-1}	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
2	Wage Inflation (Manufacturing)	3.660 (3.731)	0.0352 (4.726)	0.585 (4.010)			.831	2.09	39.43 (2,16)	9.95
3	Wage Inflation (Manufacturing)	1.510 (1.087)	0.0212 (2.192)	0.546 (4.030)	0.0014 (2.030)		.868	1.93	32.79 (3,15)	9.95
4	Wage Inflation (Manufacturing)	2.720 (2.680)	0.0303 (4.176)	0.524 (3.817)		0.524 (1.977)	.866	1.84	32.37 (3,15)	9.95

Notes: Figures in brackets are 't' statistics; C_t is the constant term; V_t unfilled vacancies; $\frac{\dot{W}}{P_t}$ the proportional change in real wages in manufacturing; D_t the ratio of profits to total compensation; $\dot{P}_{t-1/2}$ the lagged proportional change in consumer prices; S_{t-1} lagged strike frequency (all industries); SV_{t-1} lagged strike volume (manufacturing) per 10,000 working days lost.

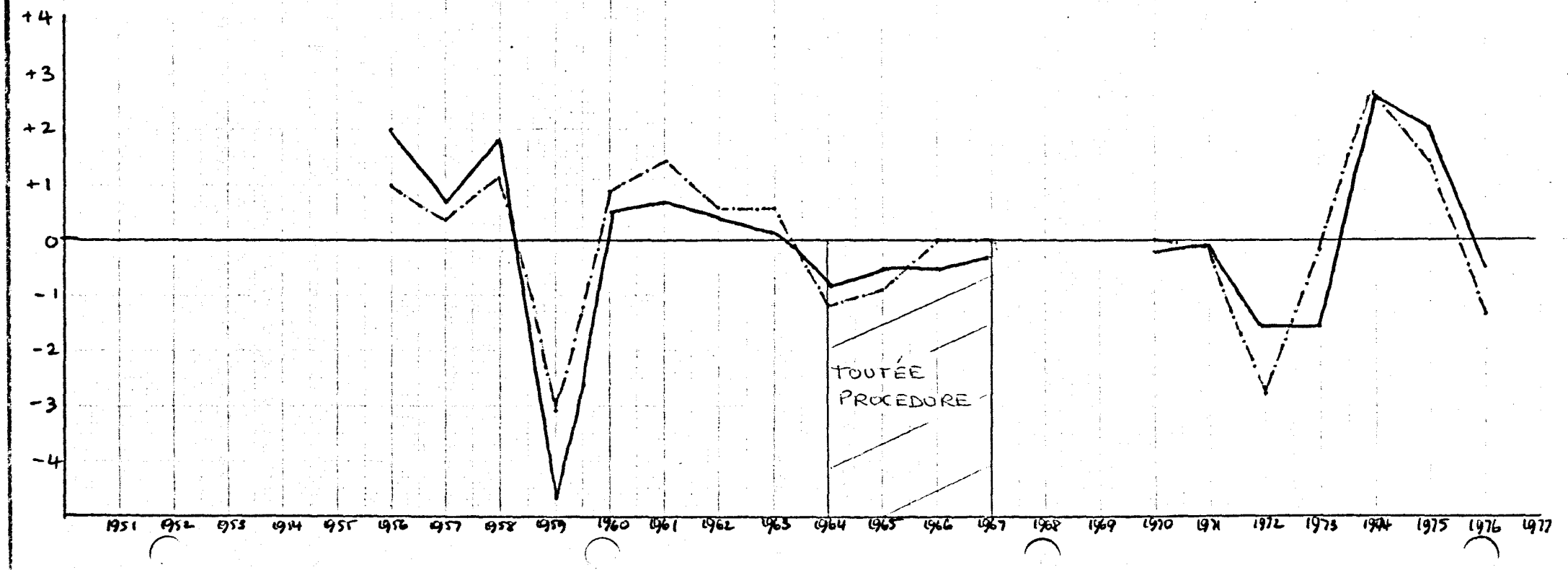
Sources: See Appendix 1

GRAPH 7.F.1

FRANCE: STRIKE FREQUENCY 1956-67; 1969-76



FRANCE : WAGE RESIDUALS 1956-67; 1969-76



ITALY

Strike Behaviour.

Like France, strikes in Italy have been characterized as responding primarily to organizational and political currents, rather than to variations in economic conditions (Synder 1975). As noted in Chapter 3, however, the empirical support for such a contention is far from compelling. These doubts are further reinforced by the present findings.

The best fitting equation in the Italian context took the following form:[18]

$$S_t = a_0 + a_1 U_t^{-1} + a_2 \dot{U}_t + a_3 \frac{\dot{W}}{P}_t + a_4 D_{t-1}$$

As equation 1 in Table 7.I.1 illustrates the above specification explains 86% of the variation in aggregate strike frequency over the period 1956-1975. The satisfactory nature of this overall performance gains further confirmation from Graph 7.I.1., which indicates a generally close correspondence between actual and fitted values over the period, with the notable exception of significant over-prediction in 1966-67 followed by under-prediction from 1968-1971.

Reference to the performance of individual variables in equation 1 provides strong evidence for the existence of behavioural relationships of the type conventionally assumed in economic analyses of strike determination. Thus, a significant positive relationship is established between strike frequency and the inverse of the level of unemployment, implying that strike activity is increased during periods of labour market tightness. In addition, the real wage variable enters with a significant negative sign, a finding broadly consistent with an expectations - achievement interpretation in which

high real wage increases are associated with satisfied wage expectations, and hence with fewer strikes. In terms of the remaining variables, both the rate of change of unemployment, and the level of real profits enter the equation with positive signs, but only achieve significance at the 10% level. In the case of the unemployment variable this implies increased strike activity during the downswing of the cycle, a finding consistent with the argument advanced by Smith (1976), that unions tend to refer to recent levels of unemployment in framing their demands and assessing their power, while employers tend to act on the basis of projections extrapolated from current changes, so that when unemployment is rising, the gap between unions and employers is widened. In the case of the lagged profits variable (measured in this case as real aggregate profits), the existence of a positive coefficient suggests the dominating influence of a union aggression effect over the counterveiling tendency for employers to adopt a more concessionary attitude when their ability to pay and opportunity costs of striking are high.

Additional insight into the impact of the Italian institutional environment on strike behaviour is realed when equation 1 is re-estimated with the real wage variable divided into its separate money wage and price components. As equation 2 indicates, while the money wage variable enters with a significant negative sign, the price variable, though positive, is insignificant. The most obvious explanation for this is that it is the result of the operation of the system of automatic wage indexation (scala mobile), which provided for automatic wage adjustments to cost-of-living changes during the period under investigation (Brandini 1975). As in Belgium, therefore, wage indexation appears to have been an effective device for reducing worker hostility over price inflation.[19] It is also interesting to note that re-estimation of the equation using strike frequency in manufacturing as the

dependent variable does little to alter the equation's overall performance. As equation 3 indicates, the only substantive change is a drop in the significance of the rate of change of unemployment.

In relation to incomes policy, as noted in Chapter 6, with a generally unsupportive institutional environment and universal union opposition, formal restraint policies have been largely precluded within the Italian context. Given this, no formal allowance was made in the estimating equation for an incomes policy effect. As Ulman and Flanagan (1971) have argued, however, "nothwithstanding the unions' reluctance to commit themselves to a formal incomes policy, the Government was able to induce unions to postpone the re-opening of their contracts in 1965." Of particular significance in this respect was undoubtedly the restraint evident in the pattern-setting three year agreement signed by the metalworkers in 1966. It could therefore be argued, with some justification, that a de facto - though informal - system of wage restraint was operative in Italy over the period 1966-1968. Moreover, it is surely no mere coincidence that this period broadly corresponds with that of the over-prediction of equation 1 evident in Graph 7.I.1., or that it immediately preceeds the period of under-prediction from 1968-1971.

Wage Behaviour.

Additional light is shed on the incomes policy issue by consideration of the wage equations presented in Table 7.I.1. In particular, it is clear both from equation 4, and from the data plotted in Graph 7.I.2, that while a basic price expectations augmented Phillips curve provides a generally satisfactory explanation of the pattern of wage inflation (as measured by changes in the index of hourly wage rates in manufacturing) over the period 1956-75, it is nevertheless prone to significant over-prediction between 1965 and 1968, and under-prediction in 1970 and 1973. It would thus appear that there are

certain parallels in the performance of both the strike and wage equations induced at least in part by the operation of the informal incomes policy,[20] with both strike and wage variables falling below their predicted values in the mid to late 1960s , and exceeding their predicted values in the early 1970s .

To explore this issue further, the basic equation was re-estimated, first with lagged strike frequency in manufacturing as an additional explanatory variable, and subsequently with lagged strike volume in manufacturing. The results are presented in equations 5 and 6. As equation 5 illustrates, though the strike frequency variable enters with a significant positive coefficient, its inclusion causes a decline in the 'F' statistic; while multicollinearity between the lagged strike variable and unemployment ($r = 0.76$)[21] also causes the latter to drop from significance. Reference to equation 5, however, reveals that substitution of lagged strike volume brings about an improvement in the equation's overall explanatory power, with the new variable both highly significant and correctly signed. Thus, while multicollinearity again causes the unemployment variable to drop from significance ($r = 0.60$) , inclusion of the strike variable is associated in this case with an increase in the value of the equation's 'F' statistic. Reference to Graph 7.I.2 reveals, however, that this improvement in fit derives largely from the augmented equation's superior performance in 1970. Given this, it would be possible, as Spinelli (1976) has observed, to replace the lagged strike volume index with a simple dummy variable for 1970 without prejudicing the equation's explanatory power. Indeed, estimation of just such an equation over the period 1954-1973 by Spinelli (1970; p. 217) confirms this result, producing a highly significant positive coefficient on the dummy variable and an improvement in the equations overall explanatory power.

In the light of these findings it is difficult to

challenge the conclusion reached by Spinelli that,

> ". . . in the long run, there is no systematic and significant influence of strike activity on the Italian rate of wage inflation, and that the union militancy hypothesis is to be rejected as a basis for a sensible explanation of the inflation phenomena experienced in Italy during the last fifteen years."
>
> (Spinelli 1970; pp 217-18)

Indeed, such a conclusion would also seem to accord with supposed weakness of the Italian labour movement as reflected in the hypotheses advanced in the context of strike behaviour by Snyder (1974, 1975).

Table 7.I.1 The Determinants of Aggregate Strike Frequency and Wage Inflation in Manufacturing: Italy 1956-1975

Estimated Coefficients on:

Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	$\dot{\overline{W}}/P_t$	D_{t-1}	R^2	D-W	'F' Stat	$\bar{S}_t$
1	Strike Frequency	-2896.9	2586860	0.786			-74.10	0.240	.862	1.41	23.37	3379
		(-1.443)	(3.889)	(1.390)			(-3.033)	(1.404)			(4,15)	
2	Strike Frequency	-4691.9	2928700	0.944	30.660	-79.01		0.3608	.870	1.55	18.76	3379
		(2.339)	(-2.600)	(1.637)	(0.594)	(-3.233)		(1.657)			(5,14)	
3	Strike Frequency (Manufacturing)	-1580.9	1380210	0.4369			-55.36	0.1463	.829	1.68	18.14	1838
		(-1.596)	(3.293)	(1.149)			(-3.345)	(1.637)			(4,15)	

Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{P}_{t-1/2}$	S_{t-1}	V_{t-1}	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
4	Wage Inflation (Manufacturing)	-2.830	5311.03	1.235			.745	2.00	24.89	10.62
		(-0.735)	(1.808)	(4. 895)					(2,17)	
5+	Wage Inflation (Manufacturing)	-2.956	1141.0	0.977	0.004		.778	2.04	19.90	10.62
		(-0.939)	(0.341)	(4.732)	(1.828)				(3,17)	
6+	Wage Inflation (Manufacturing)	0.968	1210.9	0.948		0.007	.877	1.89	40.29	10.62
		(0.449)	(0.062)	(7.080)		(4.720)			(3,17)	

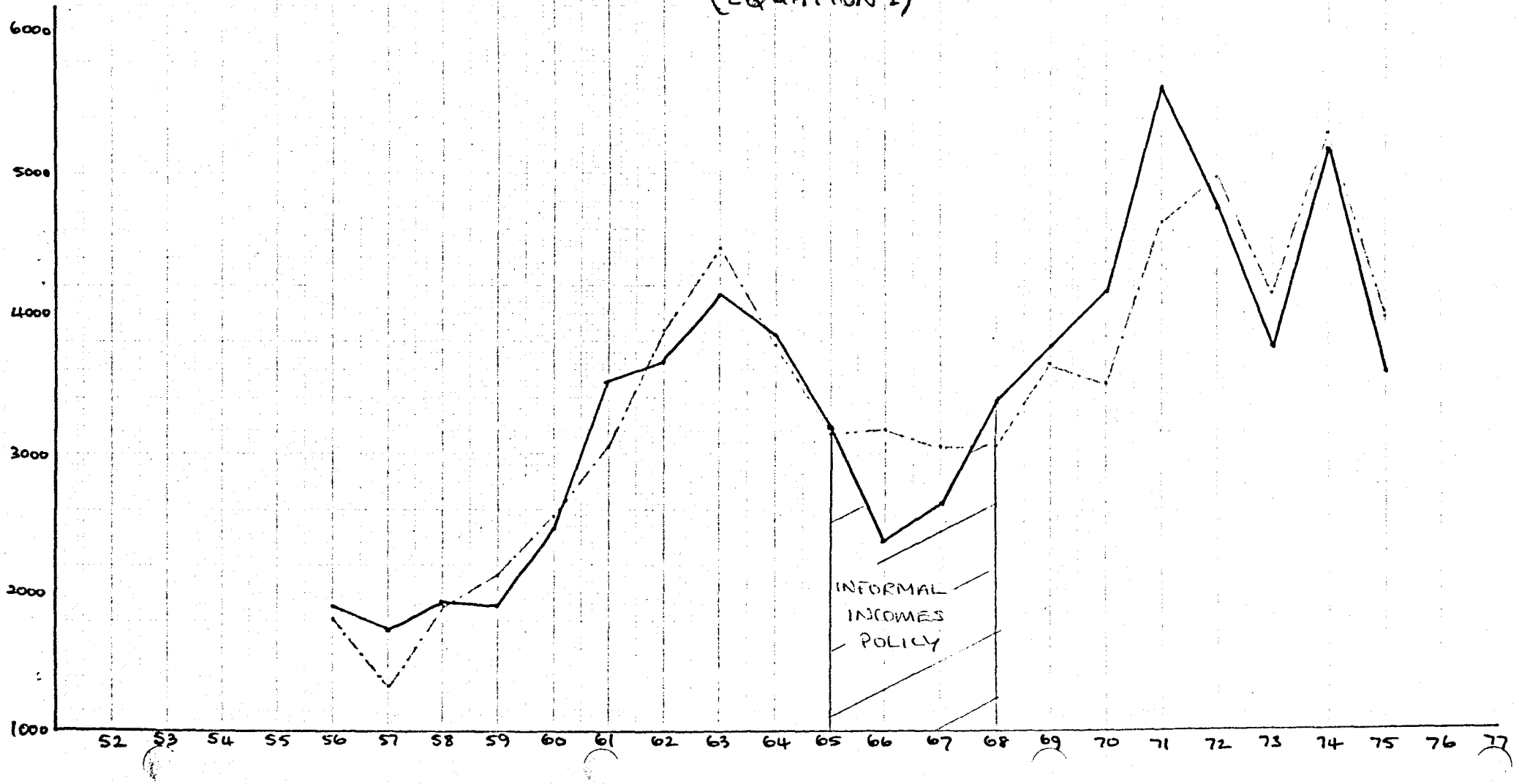
Notes: Figures in brackets are 't' statistics. C_t is the constant; U_t^{-1} the reciprocal of the unemployment level; U_t the rate of change of unemployment; $\dot{P}_t$ the proportional change in prices; $\dot{W}_t$ is the proportional change in hourly wage rates in manufacturing; $\dot{\overline{W}}/P_t$ is the proportional change in real wages; D_{t-1} is lagged real aggregate profits; S_{t-1} lagged strike frequency in manufacturing; and V_{t-1} lagged working days lost in manufacturing (10,000's).

+1956-1976

Sources: See Appendix 1

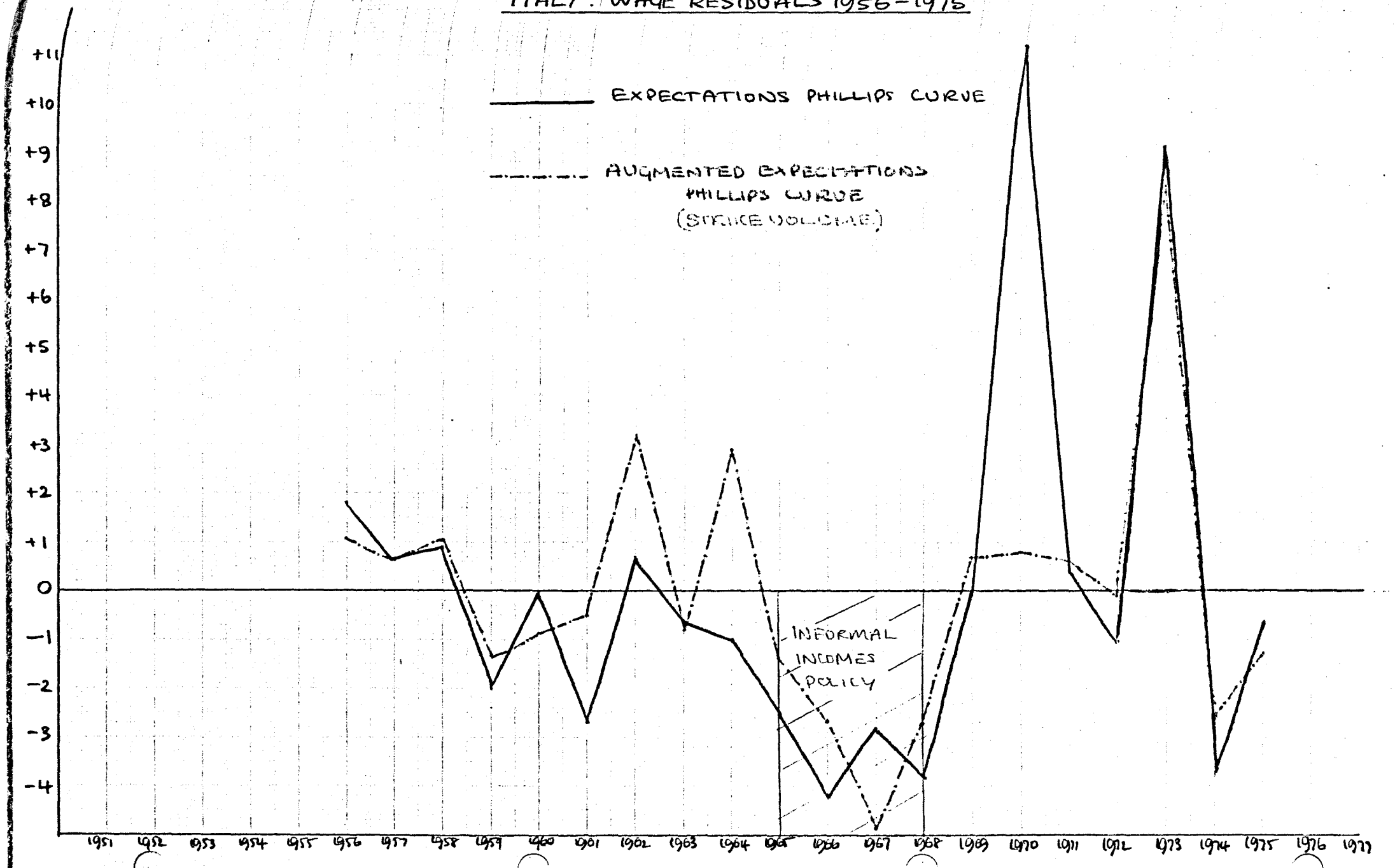
GRAPH 7.I.1

ITALY: STRIKE FREQUENCY 1956-1975



GRAFF. 1.1.2.

ITALY: WAGE RESIDUALS 1956-1975



JAPAN

Strike Behaviour

Very little empirical work has been done on the determinants of aggregate strike activity in Japan. The impression given by the comparative industrial relations literature, however, is that Japanese strike patterns are most closely akin to those of France and Italy (Ross and Hartman 1960). In each country strikes are frequent but short, while the industrial relations environments from which they derive are seen as similarly characterized by rival unionism, significant communist influence, and patterns of labour-management relations which, like their respective labour movements, are both weak and unstable (Shirai and Shimada 1978; Korpi and Shalev 1979). Moreover, given the importance of the state in Japan in determining the terms and conditions of employment, (Dore 1973), and organized labour's exclusion from political power, strikes have been viewed, like those in France and Italy, as largely political in character.[22]

Given this institutional background, it might be presumed, at least on a priori grounds, that Japanese strikes are likely to be unresponsive to variations in economic conditions, responding instead to organizational and political factors. In practice, though the above characterizations are broadly historically acccurate, they present a misleading picture of post-war industrial relations in Japan. Thus, within the larger Japanese firms, collective bargaining between management and enterprise unions is now well established. Moreover, on the wage front, the actions of individual enterprise unions have, since 1955, been actively coordinated by Sōhyō (Japan's largest union federation) into the spring wage offensive, or Shuntō, during which target wage demands are advanced via coordinated strike action. These

strikes are undoubtedly based upon partly political considerations, however their timing and frequency is also heavily influenced by prevailing economic conditions. This fact emerges strongly from the empirical work presented below.

The best fitting equation in the Japanese context took the following form:[23]

$$S_t = a_0 + a_1 U_t^{-1} + a_2 \dot{W}_t + a_3 \dot{P}_t + a_4 D_{t-1}$$

Estimation shows this equation (equation 1 in Table 7.J.1) to be consistent with 97 per cent of the variation in strike frequency over the period 1956-1975. Further confirmation of its overall explanatory power is presented in Graph 7.J.1. which plots the actual and fitted values derived from the above equation.

In terms of the performance of individual variables, both current wage changes and current price changes enter with significant positive signs (in fact, the latter variables exhibit a high degree of multicollinearity ($r = 0.86$).[24] The lagged profits variable (expressed as aggregate real profits lagged one period) also enters the equation with a significant positive sign, a finding consistent with the employer's willingness to concede during periods of high profitability being more than counterbalanced by increased union aggressiveness in the face of enhanced ability to pay.[25]

The remaining variable - the inverse of the level of unemployment - enters the equation with a significant negative sign. This implies that strike frequency in Japan is increased during periods of high unemployment. While this finding is consistent with that appearing in Belgium, Germany, the Netherlands and Sweden under cooperative incomes policies, its explanation in

the Japanese context, where a formal incomes policy has never been introduced, is very different. In practice, the most likely explanation for this relationship is Japan's lifetime employment system. Under this system the so-called 'permanent employees' of Japanese companies - who also account for the lion's share of the membership of the enterprise unions - are effectively cushioned from lay-off during periods of economic slowdown. This situation arises from the fact that when employment cut backs are considered necessary, they are typically made from within the ranks of the non-unionized 'temporary' workers and/or through reductions in the use of sub-contractors. As a result, unemployment is a much less effective constraint on union wage demands in the Japanese context than elsewhere. If, however, employers still respond to high unemployment by making significant reductions in their wage offers, the net result will be a widening of the gap between offers and demands, and an increase in the probability of strike action.[25A]

While the existence of the life-time employment system provides a consistent explanation for the existence of a positive relationship between strikes and unemployment, it also casts obvious doubts over the value of the latter variable as a satisfactory indicator of the state of the labour market. In view of this, equation 1 was re-estimated substituting the unfilled vacancy rate, V_t, in place of the unemployment variable. The results, as equation 2 in Table 7.J.1 indicates, are fully consistent with those obtained using the unemployment variable, with V_t entering with a significant positive sign. Finally, as equation 3 illustrates, none of the relationships estimated in equation 1 are qualitatively effected when strike frequency in manufacturing is substituted for aggregate strike frequency as the dependent variable.

Wage Behaviour.

Turning to the process of wage determination, as equation 4 illustrates, a basic Phillips curve, employing unfilled vacancies as an index of labour market conditions, and supplemented with a lagged price variable, is capable of accounting for 85 per cent of the variation in Shunto wage settlements over the period 1956-1975.[26] This satisfactory performance is also confirmed by reference to the pattern of residuals generated by equation 1, which are plotted in Graph 7.J.2. As the plots indicate, apart from over-predictions in 1973 and 1975, and the under-prediction of the extreme level of settlements occurring in 1974, the equation is generally consistent with recent experience.

While no theoretical justification can be given in relation to the effects of incomes policy on trade union behaviour to justify the inclusion of strike variables, their performance is nevertheless of interest given the institutional details of the wage determination process under Shunto. Here, as has been noted, target wage demands are pressed through coordinated strike action among the major enterprise unions. Equation 5 indicates the effect of adding strike frequency in manufacturing to the basic equation. In this case the strike variable is added in unlagged form because the dependent variable is settlements rather than current actual wage changes (i.e. it is assumed that whereas actual wage changes in time t are based on bargaining activity, and hence also strikes, in time t-1; settlements in time t are based upon bargaining, and hence also strikes, in time t). As can be seen from the equation, while strike frequency enters with a significant positive coefficient, multicollinearity with the lagged price variable ($r = 0.87$) causes the latter to drop from significance. The addition also produces a decline in the value of the 'F' statistic and, as can be seen from Graph 7.J.2, the expanded

equation is also unable to account for settlement behaviour over the period 1972-5. Similar problems are evident if figures for current working days lost in manufacturing are substituted for strike frequency. As equation 6 illustrates, in this case not only is the significance of the coefficient on the price term reduced, but the strike variable is also non-significant at the 5 per cent level. The superior performance of the strike frequency variable over strike volume is easily explained in the Japanese institutional context, given the emphasis on the short but frequent stoppages as an important adjunct to wage bargaining.

The very close correspondence between strike frequency and price changes makes it impossible to disentangle the separate influence of these variables in the wage determination process, at least on the basis of the results presented in equation 2. More detailed studies of Japanese inflation experience (Komiya and Suzuki 1977) have, however, argued that it was largely a demand side phenomenon (though the role of rising import prices is also acknowledged). Thus, the price explosion of 1974 is traced to the unusually high rate of money supply creation between 1971 and early 1973, and to the combined effects of tax cuts in 1971 and increasing government expenditure during the upswing of 1972-73. On the basis of this argument inflation was a cause rather than a consequence of trade union militancy. Thus, even though the strike explosion of 1974 was associated with increases in the wage base of large firms by upto 33 per cent it has been argued (Komiya and Suzuki 1977; p.323) that without such increases both labours' share in national income and real wages would have declined considerably in the face of the rapidly rising cost of living. On the basis of this argument, therefore, the strike augmented wage equation (equation 2) must be rejected in favour of the basic expectations Phillips curve in equation 1.

Table 7.J.1 The Determinants of Aggregate Strike Frequency and Wage Settlements under Shunto: Japan 1956-1975

Estimated Coefficients on:

Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{P}_t$	$\dot{W}_t$	D_{t-1}	V_t	R^2	D-W	'F' Stat	$\bar{S}_t$
1	Strike Frequency	636.14 (1.460)	-691710 (-2.873)	75.98 (4.116)	122.41 (7.233)	0.0592 (3.690)		.968	2.02	113.7 (4,15)	1795
2	Strike Frequency	-919.55 (-2.587)		119.90 (5.504)	53.58 (2.835)	0.065 (2.897)	2.287 (2.826)	.943	2.02	61.31 (4,15)	1795
3	Strike Frequency (Manufacturing)	389.4 (1.289)	-382213 (-2.299)	28.57 (2.248)	76.02 (6.430)	0.026 (2.340)		.949	1.99	69.42 (4,15)	1002

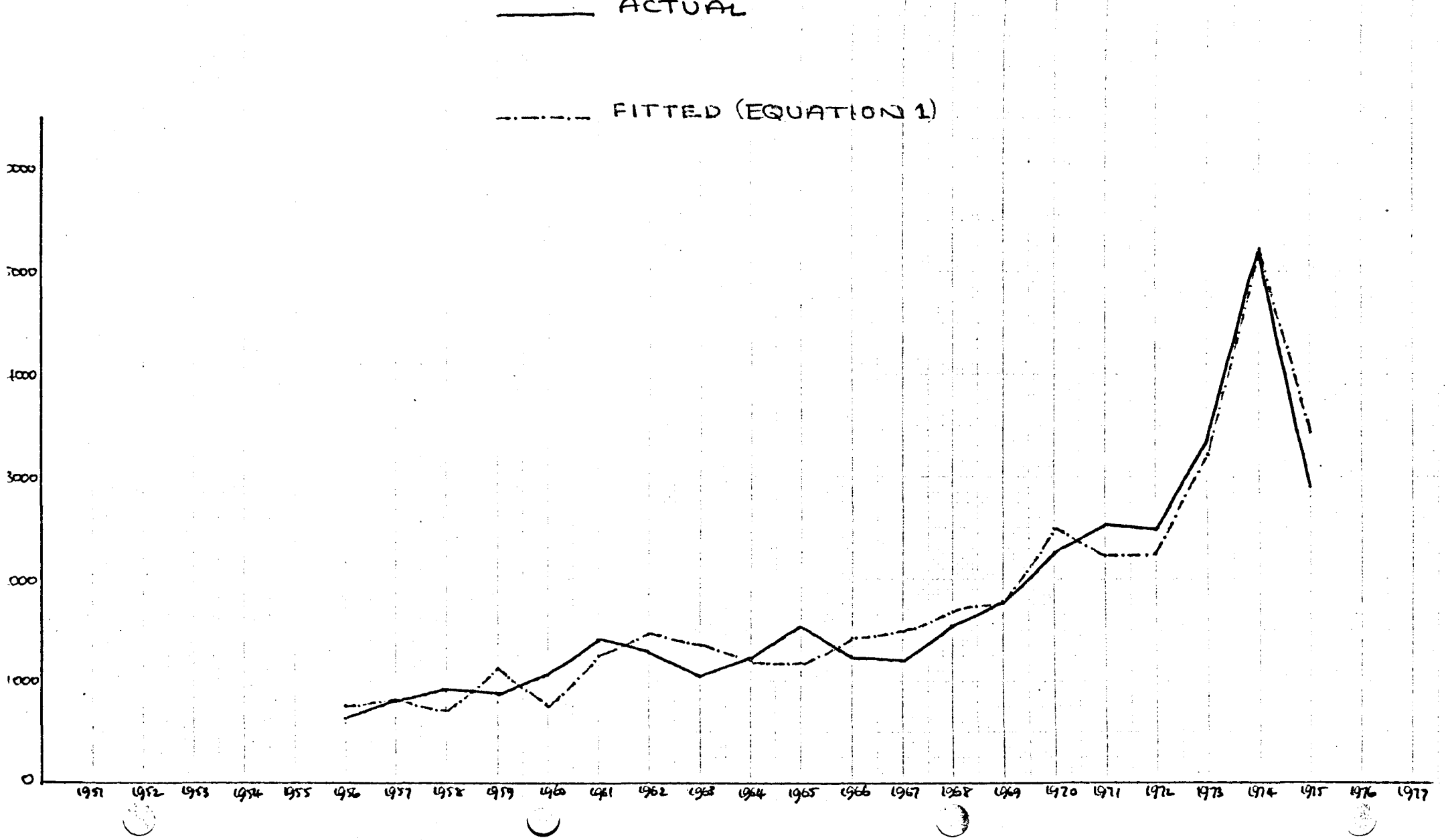
Eqn.	Dep. Variable	C_t	V_t	$\dot{P}_{t-1/2}$	S_t	WDL $_t$	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
1	Shunto Settlements	-4.73 (-2.540)	0.0373 (6.713)	0.478 (3.806)			.834	2.00	49.53 (2,17)	12.98
2	Shunto Settlements	-1.92 (-1.130)	0.0239 (3.737)	0.196 (1.144)	0.004 (2.380)		.889	2.03	42.631 (3,16)	12.98
3	Shunto Settlements	-6.05 (-2.998)	0.0638 (6.793)	0.310 (1.860)		0.0098 (1.459)	.871	1.99	35.95 (3,16)	12.98

Notes: Figures in brackets are 't' statistics; C_t is the constant term; U_t^{-1} the reciprocal of the level of unemployment; V_t unfilled vacancies; $\dot{P}_t$ the proportional change in prices; $\dot{W}_t$ the proportional change in manufacturing wage rates (monthly); D_{t-1} lagged real aggregate profits; S_t current strike frequency in manufacturing; and WDL current working days lost in manufacturing in 10,000's.

Sources: See Appendix 1

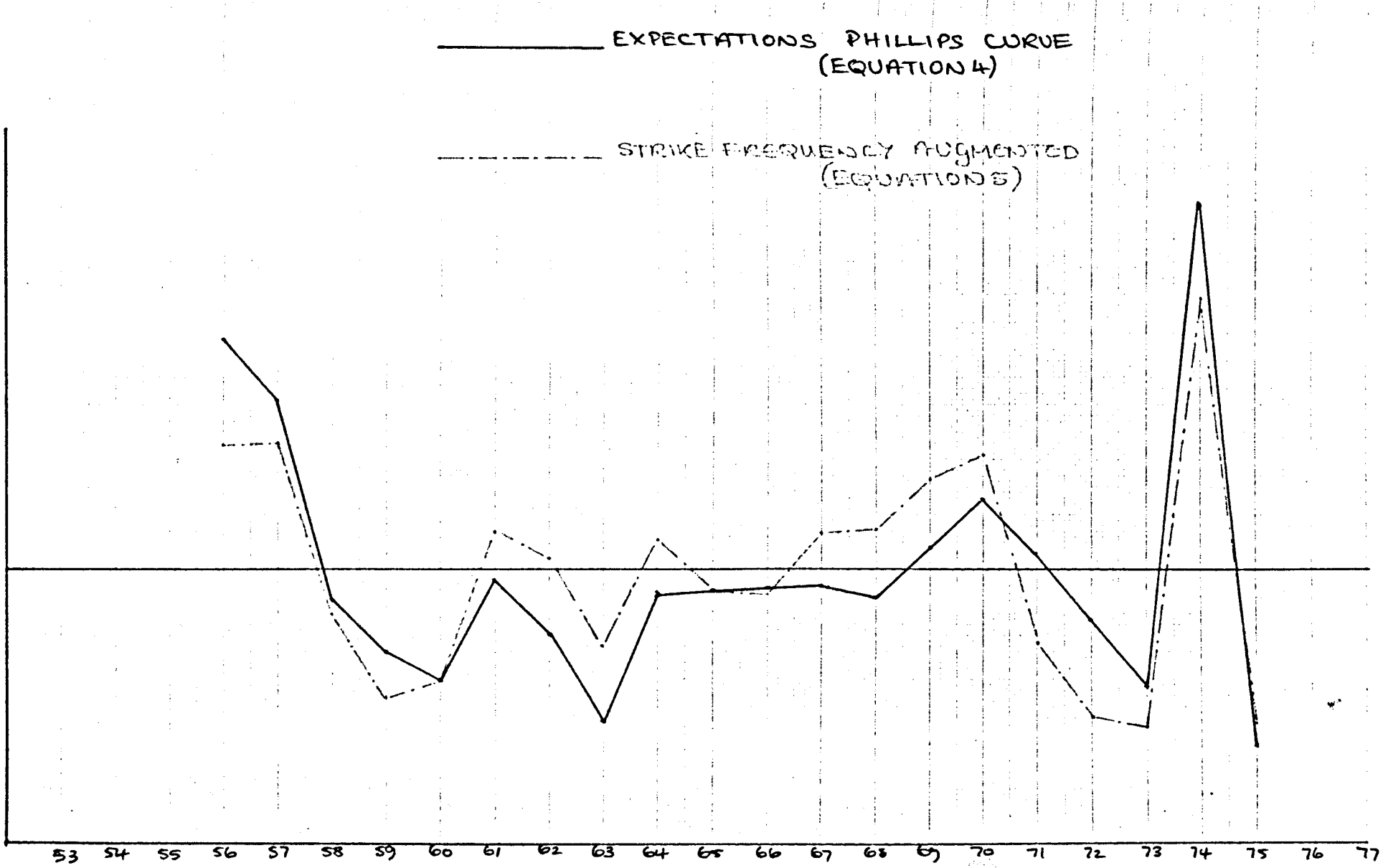
GRAPH 7.J.1

JAPAN : STRIKE FREQUENCY 1956–1975



GRAPH 7.J.2.

JAPAN: WAGE SETTLEMENT RESIDUALS 1956-1975
(SHUNTŌ)



CANADA

Strike Behaviour

A number of previous studies of Canadian strikes have confirmed their responsiveness to economic conditions (Smith 1972, 1976; Walsh 1975; Cousineau and Lacroix 1976). The present study is no exception. The best fitting equation took the following form:[27]

$$\text{Log } S_t = a_0 + a_1 U_t^{-1} + a_2 \dot{U}_t + a_3 \dot{P}_t + a_4 \dot{W}_t + a_5 D_t$$

As equation 1 in Table 7.C.1 indicates, this specification gives an outstandingly good fit, accounting for 97 per cent of the annual variation in the log of strike frequency over the period 1952-1975. Further confirmation of this performance is provided by Graph 7.C.1, which plots the actual and fitted values derived from the estimation of equation 1. In terms of the performance of individual variables, the inverse of the level of unemployment, the rate of change of unemployment and the proportional change in consumer prices all enter with positive signs, and are significant at the 5 per cent level. The two remaining variables, namely the proportional change in nominal wage rates in manufacturing, and profits (expressed as the ratio of current aggregate profits to total compensation), also enter with positive signs, but are significant only at the 10 per cent level. The latter finding, of positive coefficients on both wage and profits variables, contradicts the earlier findings of Smith (1972) and Walsh (1975), both of whom report significant negative coefficients. Thus, while it might be argued on the basis of equation 1 that in recent years Canadian workers have become more concerned over wage differentials and increases in the share of profits than previously, such an argument also serves to emphasise the relative instability of the behavioural relationships involved.

As far as the two labour market variables and the rate of inflation are concerned, the present findings are fully consistent with those of previous studies. Thus, Canadian strikes show a decline in frequency during periods of high unemployment, while also, and on the face of it somewhat paradoxically, tending to increase with increases in the level of unemployment. The latter finding is, as noted above, consistent with that reported by Smith (1976) in his study of Canadian strikes. As Smith argues, if employers are more future oriented in their labour market responses than unions, when unemployment is rising employers will base their current wage offers on an assumption of even slacker labour market conditions over the contract period, and reduce their wage offers accordingly. By tending to widen the gap between offers and demands in this way, increasing unemployment will tend to be associated with an increase in strikes.

As equation 2 in Table 7.C.1 illustrates, re-estimation of the equation using frequency in manufacturing as the dependent variable is associated with several changes in significance, though not in sign. Thus, the coefficient on the rate of change in unemployment drops below significance at the 5 per cent level; while the coefficient on the profits variable gains significance at the 5 per cent level, implying that trade union pushfulness in response to high profits outweighs employer acquiescence in the face of an increased ability to pay in the manufacturing sector.

Finally, equation 3 in Table 7.C.1 presents the results obtained from substituting a composite real wage variable in place of its separate money wage and price components. As can be seen, the real wage variable enters the equation with a significant negative sign, a finding that is consistent with that reported in previous studies.

Wage Behaviour

In the context of wage determination, as equation 4 in Table 7.C.1 illustrates, a basic Phillips curve, supplemented with a lagged price term, accounts for approximately 77 per cent of the variation in changes in hourly wage rates in Canadian manufacturing industry over the period 1952-1975. Reference to the pattern of residuals generated by the equation, and plotted in Graph 7.C.1, also confirms its overall explanatory power, although there is some evidence of deterioration from 1968 onwards. This deterioration has been alluded to in previous studies [Kaliski 1972; Rowley and Wilton 1974(a), 1974(b)]. Several explanations have been advanced. Two of which might usefully be mentioned by way of example. First, progressive increases in contract length during the 1960's greatly complicated the temporal specification of the explanatory variables, leading to the possibility of bias in Phillips curve estimates. Second, some doubt exists over the consistency of unemployment as an appropriate indicator of labour market excess demand,[28] because of demographic changes (Economic Council of Canada, 1976).

In the present context, both the level of aggregation employed and data availability place severe restrictions on the allowance that can be made for these factors.[29] One factor that can be allowed for, however, is the possible influence of trade unions, whose members account for over 70% of the production workforce in Canadian manufacturing industry. Thus, equation 5 presents the results obtained from supplementing the basic expectations Phillips curve

with lagged strike frequency in manufacturing. As can be seen from Table 7.C.1, not only does the variable enter with a highly significant positive sign, but its addition to the equation is also associated with an increase in the 'F' statistic. Reference to the pattern of residuals plotted in Graph 7.C.2 also shows that there is some improvement in the augmented equation's predictive power, especially with more recent data, over that of the basic equation; though significant under-predicitions are still evident in 1971 and 1972. Less desirable, however, is the fact that addition of the strike variable also brings about a decline in the significance of the unemployment variable (though the simple correlation coefficient between these variables is only -0.3)[30]. As one possible means of allowing for this problem, an additional equation was estimated using a 'standardized' strike variable corresponding to the residuals generated by regressing the unemployment variable on lagged strike frequency. As can be seen from equation 6, while all variables are significant and correctly signed, the substitution is associated with declines in both the correlation coefficient and 'F' statistic.

In the final equation presented in Table 7.C.1, lagged strike volume is substituted for the strike frequency variables. Again the additional variable is correctly signed, highly significant, and associated with an improvement in the equation's 'F' statistic over that in the basic equation. Moreover, this finding is also broadly in line with that reported in a quarterly analysis of wage change data over the period 1955(1) to 1969(2) (Swidinsky 1972). In the light of this evidence it is hard to dismiss Canadian Union activity, and their strike behaviour in particular, as irrelevant to the process of wage determination.[30A]

Table 7.C.1. The Determinants of Strike Frequency and Wage Inflation in Manufacturing: Canada 1952-1975.

Eqn. Dep. Variable	Estimated Coefficients on: C_t	U_t^{-1}	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	$\frac{\dot{W}}{P_t}$	D_t	R^2	D-W	'F' Stat	$\bar{S}_t$
1 Log.Strike Frequency	4.991 (7.847)	209.34 (4.748)	0.002 (4.358)	0.0162 (3.603)	0.022 (1.595)		0.035 (1.582)	.969	2.01	113.49 (5,18)	5.948
2 Log.Strike Frequency (manufacturing)	3.532 (3.832)	221.21 (3.466)	0.001 (1.602)	0.0159 (2.447)	0.0266 (1.359)		0.0564 (1.785)	.943	2.50	59.95 (5,18)	5.202
3 Log.Strike Frequency	5.567 (8.015)	223.15 (5.071)	0.002 (4.095)			-0.014 (-2.971)	0.045 (1.956)	.962	1.86	120.78 (4,19)	5.948

Eqn. Dep. Variable	C_t	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	V_{t-1}	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
4 Wage Inflation (hourly rates)	0.850 (1.254)	1283.6 (3.205)	0.359 (3.048)			.768	1.78	34.71 (2,21)	5.98
5 Wage Inflation	-2.470 (0.193)	517.0 (1.933)	0.264 (2.05)	0.016 (5.353)		.866	2.11	43.24 (3,20)	5.98
6 Wage Inflation	0.828 (0.830)	587.41 (2.704)	0.717 (6.885)	0.012† (4.382)		.826	2.21	31.61 (3,20)	5.98
7 Wage Inflation	0.899 (0.694)	300.40 (1.061)	0.477 (4.247)		0.014 (4.903)	.853	2.25	38.57 (3,20)	5.98

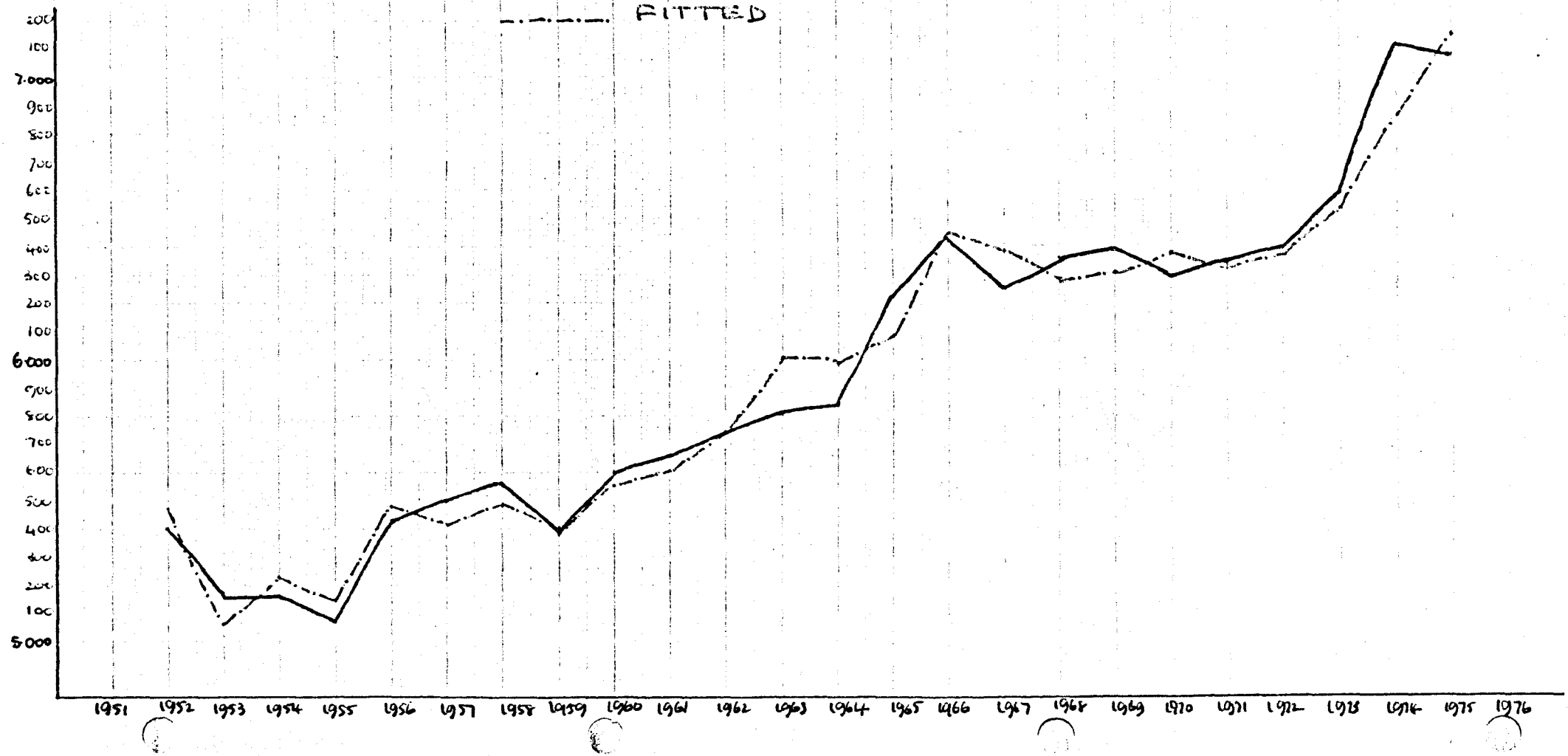
Notes: Figures in brackets are 't' statistics. C_t is the constant; U_t^{-1} the reciprocal of the unemployment $\dot{U}_t$ the rate of change of unemployment; $\dot{P}_t$, $\dot{W}_t$, $\frac{\dot{W}}{P_t}$ are the proportional change in prices, wages and real wages respectively; D_t is the ratio of aggregate profits to total compensation; S_{t-1} and V_{t-1} are lagged strike frequency and lagged strike volume in 10,000's.

† = corrected for unemployment.

Sources: See Appendix 1.

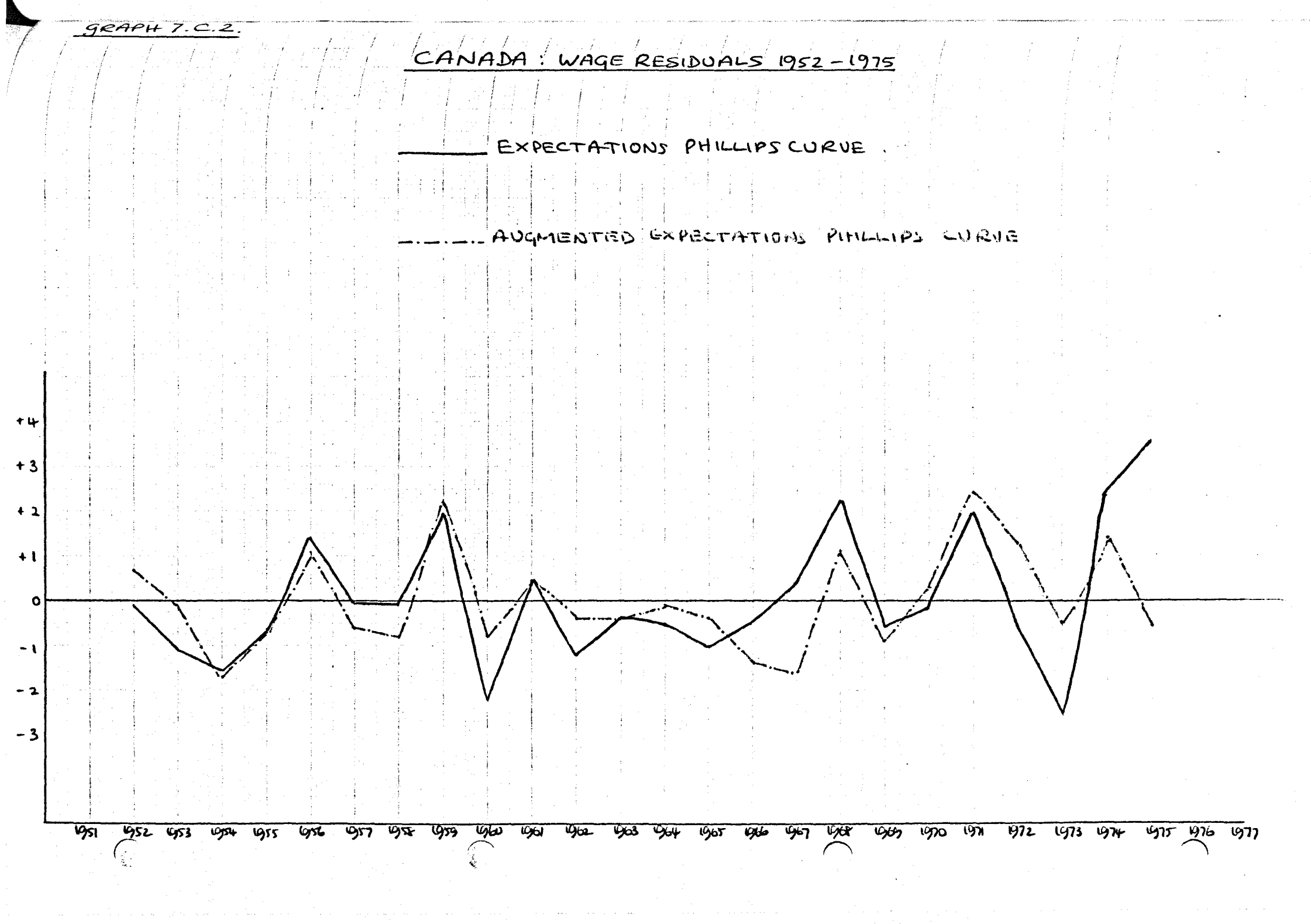
GRAPH 7. C. 1

CANADA : LOG STRIKE FREQUENCY 1952 - 1975



GRAPH 7.C.2.

CANADA : WAGE RESIDUALS 1952 - 1975



UNITED STATES

Strike Behaviour

As noted in Chapter 2, the first attempt to apply econometric techniques to the estimation of the relationship between fluctuations in strike activity and the various components of the business cycle was made in the U.S. context by Ashenfelter and Johnson in 1969. Despite the many criticisms that have been made of the operational model derived from this analysis, it is significant that the best fitting equation emerging from the present study of annual strike frequency data is virtually identical to the original Ashenfelter-Johnson quaterly model. The only major difference between the models, apart from the obvious one of the periodicity of the data, and the omission of the trend term, is the inclusion in the present equation of a dummy variable taking the value of one during the operational phases of wage policy (namely 1951-1952; 1962-1965; 1971-1972).

The complete specification is as follows:[31]

$$S_t = a_0 + a_1 U_t^{-1} + a_2 \frac{\dot{W}}{P_t} + a_3 D_{t-1} + a_4 F_t$$

As equation 1 in Table 7.U.S.1 indicates, the above specification accounts for 93 per cent of the variation in aggregate U.S. strike frequency over the period 1953-1974. Further confirmation of this performance is provided in Graph 7.U.S.1, which contains plots of the actual and the fitted values generated by equation 1. In the context of individual variables, all of the hypotheses originally advanced by Ashenfelter and Johnson are broadly confirmed. Thus, U.S. strike frequency appears to be inversely related to both the level of unemployment and to real wage changes; although in contrast to Ashenfelter and Johnson's findings, the lagged profits variable (expressed as the ratio of aggregate profits to total compensation), enters the present

equation with a significant negative sign. Consideration of the wage restraint dummy also shows strike frequency to have been significantly reduced by incomes policies, although a re-entry dummy variable included in earlier estimations proved insignificant. A recent quarterly study of U.S. strikes has, however, established a significant positive re-entry effect (Shalev 1980). The explanation for this discrepancy is simply that annual data are not sensitive enough to pick this up where operational and re-entry phases occur within the same year.

Re-estimation of equation 1, substituting separate money wage and price variables in place of the single real wage variable, (equation 2), produces the expected significant positive coefficient on the price term; but while the coefficient on the wage term is negative as expected, it is insignificant. Finally, re-estimation using strike frequency in manufacturing in place of aggregate strike frequency as the dependent variable, as in equation 3, produces no qualitative changes in the results.

Wage Behaviour

In the context of wage determination, as equation 4 in Table 7.U.S.1 illustrates, a basic Phillips' relation, supplemented with a lagged price term, accounts for approximately 83 per cent of the variation in changes in hourly wage rates in U.S. manufacturing industry over the period 1953-1974. Reference to the pattern of residuals generated by the equation, and plotted in Graph 7.U.S.2, offers further confirmation of the equation's explanatory power, though as in Canada there is some evidence of deterioration in the equation's performance from 1968 onwards. Indeed, comparisons between the

residuals generated by the basic expectations Phillips curve after 1968 in Canada and the United States reveal a remarkably similar pattern, a fact which clearly points to the possibility of common causality.

Given the existence of an incomes policy effect in the U.S. strike data, and in order to examine further the role of the unions in the wage determination process, equations 5 and 6 present the results obtained from supplementing the basic equation, first with a lagged manufacturing strike frequency variable, and then with a lagged manufacturing strike volume variable. As can be seen, in neither case are these additional variables significant, and in the case of the frequency measure the coefficient also has the wrong sign. In addition, in each case inclusion of the strike variable is associated with a decline in the 'F' statistic. Given these results, it is hard to sustain the proposition that the strike behaviour of American unions has been effective in extracting a pattern of wage settlements that diverges significantly from those dictated by prevailing labour market conditions.[32]

Table 7.U.S.1. The Determinants of Aggregate Strike Frequency and Wage Inflation in Manufacturing: The United States 1953-1974.

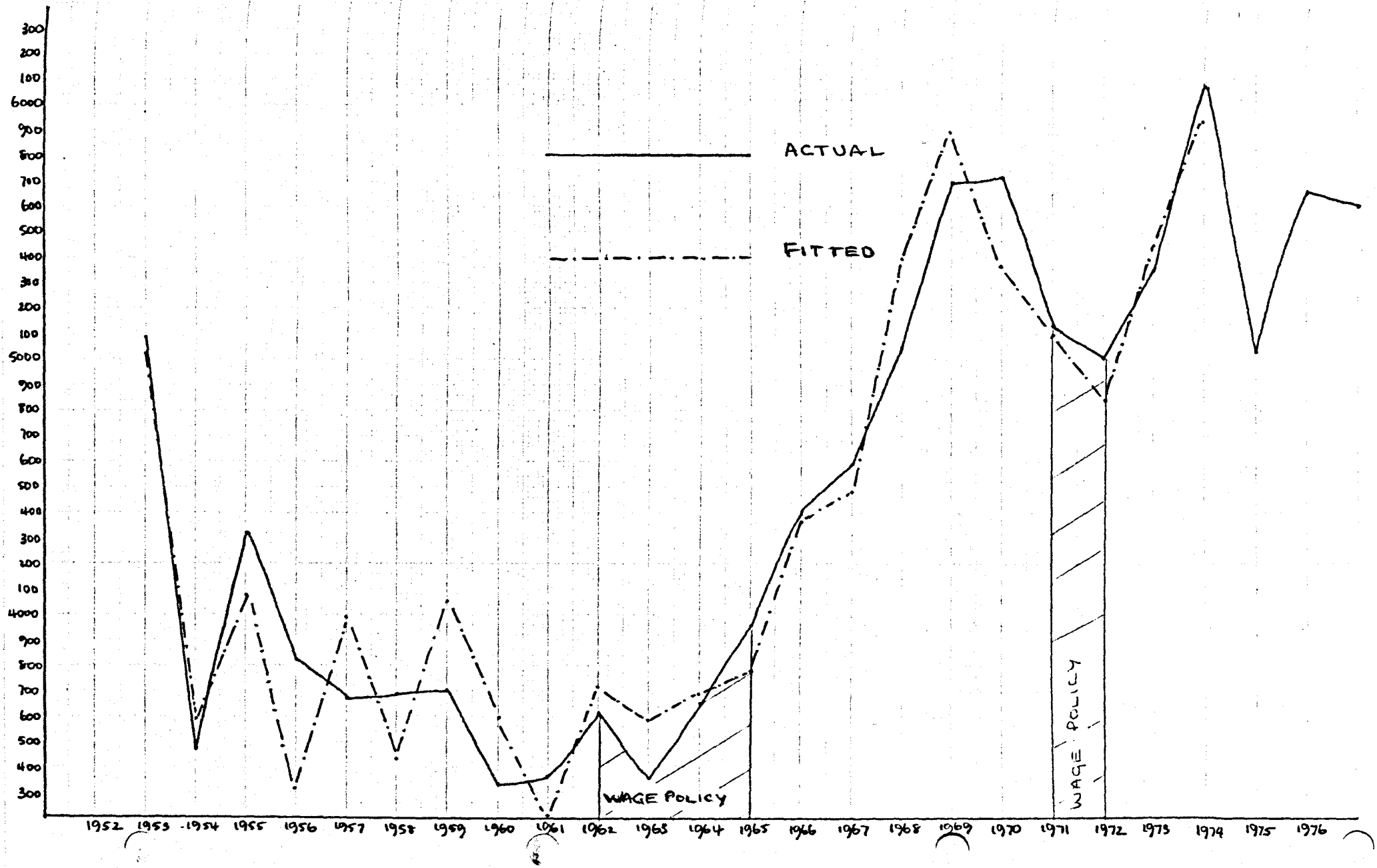
Eqn.	Dep. Variable	Estimated Coefficients on: C_t	U_t^{-1}	$\dot{P}_t$	$\dot{W}_t$	$\frac{\dot{W}}{P_t}$	D_{t-1}	F_t	R^2	D-W	'F' Stat	$\bar{S}_t$
1	Strike Frequency	9257.2 (28.449)	13664800 (17.532)			-139.29 (-3.841)	-743.90 (-19.91)	-464.67 (-4.550)	.931	2.37	57.29 (4,17)	4369
2	Strike Frequency	8478.1 (8.850)	12590600 (8.602)	140.10 (3.82)	-86.47 (-1.213)		-671.37 (-7.325)	-394.60 (-3.010)	.934	2.38	45.31 (5,16)	4369
3	Strike Frequency (manufacturing)	3483.4 (15.640)	6007390 (11.315)			-75.99 (-3.240)	-252.06 (-10.170)	-237.12 (-3.380)	.868	2.16	27.93 (4,17)	2157
Eqn.	Dep. Variable	C_t	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	V_{t-1}			R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
4	Wage Inflation(hourly rates)	3.82 (1.615)	13767.5 (6.143)	0.220 (1.970)					.834	2.05	47.56 (2,19)	4.58
5	Wage Inflation	6.25 (2.049)	13649.5 (6.332)	0.229 (2.094)	-0.0007 (-1.423)				.851	1.96	34.33 (3,18)	4.58
6	Wage Inflation	4.003 (1.566)	13330.4 (5.322)	0.2217 (1.934)		0.0004 (0.421)			.835	2.08	30.44 (3,18)	4.58

Notes: Figures in brackets are 't' statistics. C_t is the constant; U_t^{-1} the reciprocal of the level of unemployment; $\dot{W}_t$, $\dot{P}_t$ and $\frac{\dot{W}}{P_t}$ are the proportional changes in wages, prices, and real wages respectively; D_{t-1} is the lagged profits ratio; F_t a wage restraint dummy; S_{t-1} and V_{t-1} are lagged strike frequency and lagged strike volume respectively, both in manufacturing and; $\bar{S}_t$ and $\bar{\dot{W}}_t$ are the means of the dependent variables.

Sources: See Appendix 1.

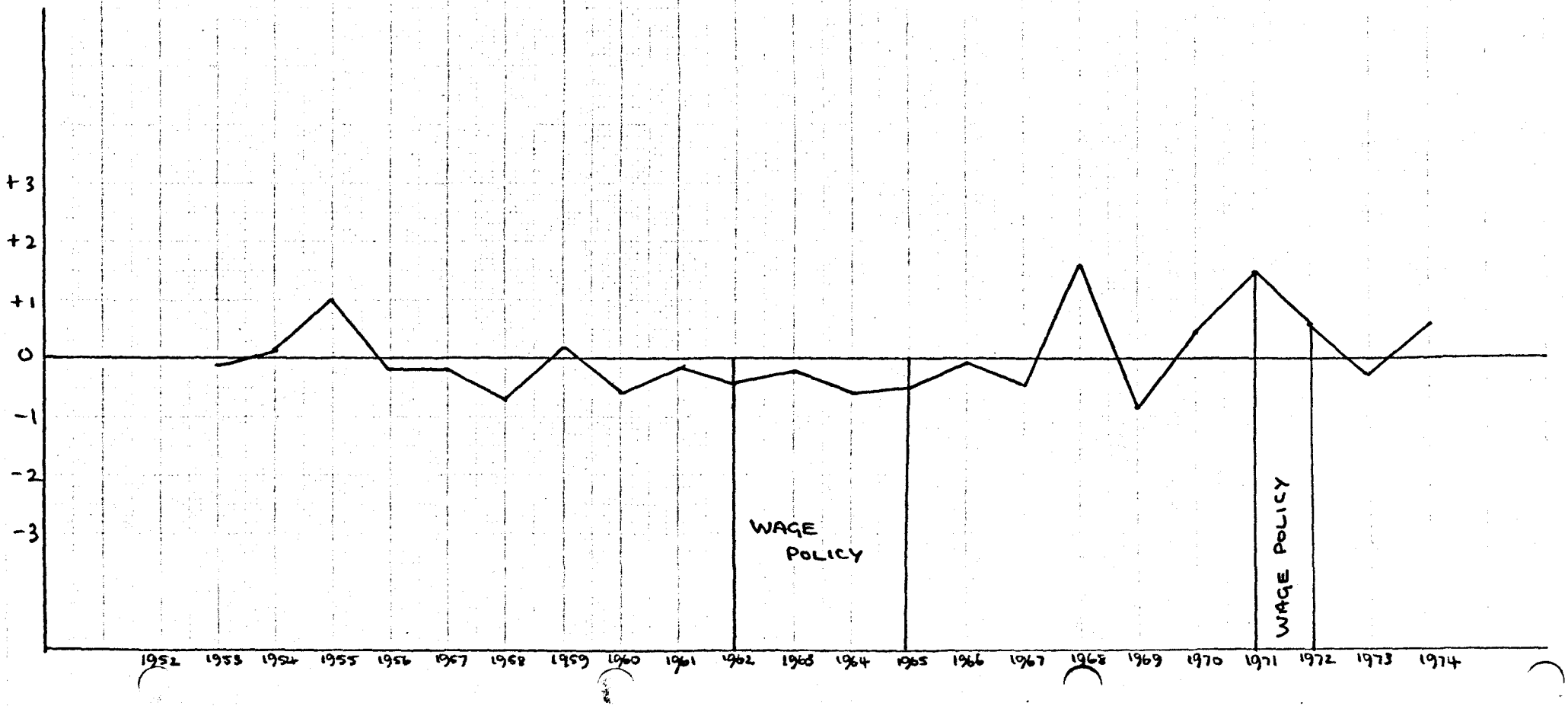
GRAPH 7.U.S.1

UNITED STATES: STRIKE FREQUENCY 1953-1974



GRAPH 7.U.S.2.

UNITED STATES : WAGE RESIDUALS 1953-1974



UNITED KINGDOM

Strike Behaviour

While the first econometric study of British strike statistics provided strong support for the economic model developed by Ashenfelter and Johnson (Pencavel 1970), subsequent work has been much less supportive. In particular, as noted in Chapter 2, the predicted inverse relationship between unemployment, used as a proxy for the state of the labour market, and strike frequency, has not been confirmed by all subsequent studies (Shorey 1977, Knight 1972, Hunter 1973); while coefficients with both positive and negative signs have been found to be significant for real corporate profits. Considerable ambiguity is also evident in the literature on the precise impact of incomes policy. Thus, despite the widespread conviction that such policies have had a depressive effect on strike frequency, empirical confirmation of this result has proved elusive.

As can be seen from equation 1 in Table 7.U.K.1, estimation of the basic model over the period 1952-1976 does little to resolve the ambiguities outlined above. Only three variables appear significant at the 5 per cent level: namely, the rate of change of unemployment and the ratio of pre-tax to post-tax disposable income R_t, which are both inversely related to strike frequency; and the post incomes policy re-entry variable, F_{1t} (entered in 1971 and 1974), which is positively related to strike frequency. Of the remaining variables, both unemployment and price changes enter with the wrong sign, implying that strike frequency is increased during periods of high unemployment and reduced during periods of high inflation. In addition, earlier estimation including dummy variables for 'hard' and 'soft' operational phases of incomes policy also produced insignificant results.

In view of this poor performance, the basic model was re-estimated for the sub-periods 1952-1965 and 1966-1975. The latter period is of particular interest because it includes that over which the original Ashenfelter and Johnson model appears to break down. It also reflects a period of unusual turmoil in the area of collective bargaining, with accelerating rates of domestic and world inflation, growing unemployment, a decline in the rate of profit, and of particular relevance in the present context, a much greater degree of government intervention through successive incomes policies. In the British context these policies took a wide variety of forms, ranging from short term unilaterally imposed freezes, to long run appeals for cooperation in programmes of restraint. In order to examine more adequately the impact of this variety of forms of intervention, a quarterly model is substituted for the later sub-period. In the earlier period, (1952-1965), however, an annual specification of the following form provided the best fit to the data[33].

$$S_t = a_0 + a_1 U_t^{-1} + a_2 \dot{U}_t + a_3 \dot{P}_t + a_4 \dot{W}_t + a_5 D_t + a_6 R_t$$

Where the dependent variable is aggregate strike frequency excluding mining; U_t and $\dot{U}_t$ are the level, and changes in the level of unemployment respectively; $\dot{P}_t$ is the current proportional change in the retail price index; $\dot{W}_t$ the current proportional change in weekly wage rates in manufacturing; D_t is current gross trading profits deflated by the retail price index; and R_t

is the ratio of post-tax to pre-tax disposable income.

As can be seen from equation 2 in Table 7.U.K.1, this specification explains over 98 per cent of the variation in non-mining strike frequency over the period 1952-1965, with all variables except real profits significant at the 5 per cent level. Further confirmation of this performance is presented in Graph 7.U.K.1, which contains plots of the actual and fitted values associated with equation 2. Additional reassurance may be derived from the fact that the results embodied in equation 2 are consistent with those reported by Pencavel (1970), and discussed in some detail in Chapter 2. Thus, in both the present equation and that of Pencavel, the level of unemployment and money wage changes are inversely related to strike frequency; while price changes and real profits are positively related (though in the case of the latter variable the coefficient is only significant at the 10% level). In addition to supporting the basic Ashenfelter and Johnson model and re-confirming the findings of Pencavel, equation 2 also suggests the importance of two additional variables in the U.K. context. First, strike frequency appears to be significantly reduced by increasing (as well as high) unemployment; second, strike frequency appears significantly increased by erosions in worker's post-tax disposable income.

For the later sub-period 1966-1975, the best fitting quarterly equation took the following form:[34]

$$S_t = a_o + a_1\dot{U}_t + a_2 \sum_{i=0}^{3} \dot{P}_{t-i} + a_3 R_t + a_5 D_t$$
$$+ a_6 Y_{2t} + a_7 Y_{3t} + a_8 Y_{4t} + a_9 T_t + a_{10} F_{1t} + a_{11} F_{2t} + a_{12} F_{3t}$$

The additional variables Y_2, Y_3, and Y_4 are seasonal dummies representing the second, third, and fourth quarters of the year respectively; while the variables F_{1t}, F_{2t}, and F_{3t} are incomes policy dummies representing hard, soft, and re-entry phases of the policies' operations.[35] The price variable is entered as a four-quarter lagged value. It should also be noted that both the level of unemployment and the wage variable have been dropped since neither appeared significant on the basis of normal statistical criteria.

As can be seen from Table 7.U.K.1., the equation has been fitted with three separate dependent variables: namely, aggregate strike frequency; pay strike frequency; and non-pay strike frequency. The rationale behind this is simple. Since the model of strike activity developed in Chapters 5 and 6 is based on the assumption that all disputes occur over wages, or wage related issues, it would seem appropriate that where data is available (as in the United Kingdom), it should be tested using pay stoppages as the dependent variable.[36] This approach contrasts markedly with that followed in previous studies, as well as so far in this chapter, where sole reliance is placed upon the total number of disputes beginning in each period. The usual justification given for this is that official statistics of pay stoppages (where they are available) mis-state the true measure because they emphasize the single immediate causes of a stoppage, rather than the complex of underlying issues. However, while it is accepted that any attempt to classify such a complex form of social action as a strike is liable to be somewhat arbitrary, it is nonetheless considered that some distinction between pay and non-pay stoppages is worth making.

In terms of results, reference to equations 3, 4 and 5 in Table 7.U.K.1. and to Graph 7.U.K.2 confirms this model's overall explanatory power. In the

case of equation 3, all coefficients except those on the third and fourth quarter seasonal dummies, the trend term, and the hard and soft phases of incomes policy are significant; though the real profits variable is only on the margin of significance at the 5 per cent level.

In equation 4 ,with pay strike frequency as the dependent variable, all coefficients except those on the third and fourth quarter seasonal dummies, the trend term, and real profits variable are significant. Finally, in equation 5 all coefficients except those on the second quarter seasonal dummy and the soft phase of incomes policy are significant, though in the case of the latter variable the coefficient is only marginally below significance at the 5 per cent level.

Comparison of the three equations indicates that the rate of change of unemployment, the expected rate of inflation, and the erosion of net disposable income all appear to have had a significant impact on both pay and non-pay strike frequency, and hence on aggregate strike frequency. More specifically, increasing unemployment has been associated with a decline in strike frequency, while inflation and the erosion of net disposable income has tended to stimulate them.

With respect to real profits, the seasonal dummies, and the income policy variable, important contrasts are evident between the three equations. In relation to seasonal variations in strike activity, there is evidence for the existence of peaks in pay strike frequency during the second, and to a lesser extent during the fourth quarter of the year. An obvious explanation for this is that these are periods of heaviest wage bargaining activity, and hence the probability of a strike occuring is likely to be correspondingly higher at such times. In terms of non-pay strikes, by contrast, strikes appear to be significantly lower during the last six months of the year. This pattern may

be interpreted as broadly in line with variations in the costs of striking, since expenditure commitments are likely to be higher during the summer holiday period, and before Christmas. Finally, turning to the seasonal pattern in aggregate strike frequency, as one would expect, equation 3 reflects the net effect of the different seasonal patterns in pay and non-pay strikes, with the only significant coefficient appearing in the second quarter.

An interesting contrast is also apparent in the context of the real profits variable. This variable, it will be recalled, is capable of conflicting interpretations since 'ability to pay' might be considered to affect both union wage demands and employer wage offers in the same direction, as well as affecting employer's estimates of the opportunity costs of striking. As equation 4 indicates, in relation to pay strikes the appearance of a negative but insignificant coefficient for real profits is consistent with these various influences having largely cancelled one another out - a not unexpected result given the multiple role that the real profits variable is called upon to perform. Turning to non-pay strikes, as equation 5 illustrates, the profits variable enters with a highly significant negative sign. An obvious explanation is that while high profits might tend to make employers more willing to grant concessions over non-pay related issues in the face of a strike threat because of the higher opportunity costs involved, there is, in contrast to the situation prevailing in the case of pay issues, no corresponding tendency for workers to increase their demands over such issues when profits are high. Thus, turning to the aggregate strike frequency equation, the marginally significant negative coefficient on real profits may be readily interpreted as reflecting the net effect of the separate relationships outlined above.

The most interesting contrast between the findings of the three equations is undoubtedly that which occurs with respect to the impact of incomes policy. It will be recalled that in general it was expected that the operational phases of such policies would be associated with a decline in strike frequency. In the context of pay strikes this expectation is largely confirmed. Thus, according to equation 4, both 'hard' and 'soft' phases of incomes policy have been associated with reductions in strikes, with the soft phase apparently more significant in this respect. The importance of the re-entry variable is also confirmed, with the one year period following the demise of an incomes policy associated with a significant increase in strike frequency. Considered over its complete life-cycle, therefore, the net impact of incomes policy on pay strike frequency, though still significantly negative, is considerably less pronounced than sole reference to its operational phases would suggest.

Reference to equation 3 serves to confirm the importance of the re-entry variable for aggregate strike frequency; however in this case, neither of the coefficients on the policy's operational phases are statistically significant. Indeed, in the case of the 'hard' phase of the policy, the coefficient is actually positive, suggesting that periods of wage-freeze and severe restraint have actually been associated with an increase in aggregate strike activity. The answer to this apparent paradox is provided by equation 6, which indicates that both hard and soft phases of incomes policy have been associated with an increase in the frequency of non-pay strikes. Moreover, in the case of the hard phase, this increase has been sufficient to more than outweigh the decrease occuring in the frequency of pay stoppages.

One possible explanation for this result is that stricter forms of incomes policy, which involve a greater degree of government intrusion into collective bargaining, have tended to promote greater union antagonism. Thus, if the union rank and file are strongly against incomes policy, the political cost to the union leadership of acceding to it will be high, reducing the costs of striking; however, the policy will also serve to increase the potential political costs to the union of striking to obtain wage increases in excess of the statutory maximum. An obvious solution to this dilemma is for rank and file antagonisms to be channelled into non-pay areas, where the possibility for gaining management concessions is unconstrained by external government interference.

Wage Behaviour

Given the present concern with the role of trade union action in the colective bargaining process, the ideal dependent variable is some measure of negotiated wage settlements, rather than a more conventional series such as wage rates or earnings. For most of the countries in the present sample, with the notable exception of the Shunto settlements in Japan, such a series is unavailable. This, however, is not true of Britain[37], and a settlement series is therefore employed in subsequent regressions.

As was noted in Chapter 4, and as equation 1 in Table 7.U.K.2 indicates, the performance of a simple price expectations Phillips curve fails to provide a fully satisfactory explanation of U.K. wage settlements over the period 1952-1975. While 78 per cent of the variation in the dependent variable is 'explained', the labour market variable enters with a significant negative sign - implying higher settlements during periods of increased unemployment.

Reference to Graph 7.U.K.3. also highlights the equation's uneven performance. First, over the period 1952-1965 substantial prediction errors are evident. Re-estimation of the basic equation for this sub-period,

however, produces a much more satisfactory expectations Phillips curve, containing a significant and correctly signed unemployment term (see equation 2), as well as a more acceptable pattern of residuals (Graph 7.U.K.4): though even here there is evidence of a deterioration in explanatory power around the pay-pause of 1961-62. Returning to the original equation, consistent over-prediction is apparent from 1962 until 1968, a period corresponding to the operation of incomes policy; while the breakdown in the policy in 1969-1970 is associated with significant under-predicition of the actual pattern of settlements. Significant under-prediction is also evident in 1972, a year of more or less free collective bargaining; while over-prediction again occurs in 1973, during a period of severe wage restraint. At least from the early 1960's, therefore, it appears that the prediction errors generated by equation 1 are related in a fairly systematic way to the operation of incomes policies.

As equation 3 in Table 7.U.K.1 illustrates, inclusion of strike frequency in manufacturing (specified in unlagged form because of the use of settlements as the dependent variable), significantly increases the equation's explanatory power, with the new variable entering with a highly significant positive sign. In addition, it appears that once the influence of strike action is controlled for, the unemployment variable drops from significance, and loses its anomalous negative sign.[38] Reference to the pattern of residuals generated by the augmented equation also illustrates its improved performance over equation 1, particularly in relation to the wage escalation of 1970. Despite the later success, however, the equation still has a tendency to overpredict during the period 1962-1968, and is also unable to explain the wage escalations of 1972. Finally, as equation 4 indicates, substitution of working days lost in manufacturing in place of strike frequency actually

worsens the performance of the equations, even though the additional variable is both correctly signed and significant.

To summarize, on the basis of these results, it seems clear that British unions, acting through the medium of strike activity, have had a significant impact on the pattern of wage settlement. Moreover, the exercise of this influence appears to be closely related to the operation of incomes policy, with settlements dropping during the operational phase of the policy, and rising substantially during re-entry phases to the accompaniment of significant escalations in strike frequency.

Table 7.U.K.1. The Determinants of Aggregate Strike Activity in the United Kingdom 1952-1965; 1966(i) to 1975(iv)

Estimated Coefficients on:

Eqn. Dep Variable	C_t	U_t^{-1}	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	$\frac{\dot{W}}{P_t}$	D_t	R_t	F_{1t}	R^2	D-W	F Stat	$\bar{S}_t$
1 Strike Frequency (ex-mining) 1952-76)	24434.4 (3.340)	-1193.7 (-1.108)	-2.250 (-2.981)	-47.18 (-1.643)	14.91 (1.016)		-0.0759 (-0.652)	-258.4 (-3.425)	709.36 (3.964)	.935	1.88	314.82 (8,16)	1519
2 Strike Frequency (ex-mining) 1952-65	14814.2 (2.856)	64780.4 (1.867)	-1.504 (-4.725)	109.78 (3.697)	-140.22 (-4.100)		0.0939 (1.534)	-170.39 (-3.13)		.987	2.25	77.12 (5, 7)	841

Eqn. Dep Variable	C_t	$\dot{U}_t$	$\sum_{i=0}^{3} \dot{P}_{t-i}$	D_t	R_t	Y_{2t}	Y_{3t}	Y_{4t}	T_t	F_{1t}	F_{2t}	F_{3t}	R^2	DW	'F' Stat
3 Aggregate Frequency 1966(i)-75(iv)	10449.3 (4.20)	-1.86 (-3.47)	28.81 (3.49)	-34.41 (-1.69)	-114.78 (-3.74	98.31 (2.11)	-6.86 (-0.39)	-35.26 (-0.77)	5.17 (0.93)	39.48 (0.74)	-16.05 (-0.23)	202.86 (3.75)	0.804	1.99	10.42 (11,28)
4 Pay-Frequency 1966 (i)-75(iv)	7388.7 (3.94)	-29.82[1] (-4.18)	18.96 (2.75)	-13.31 (-0.82)	-82.26 (-3.59)	88.74 (3.57)	12.03 (0.43)	32.33 (1.33)	2.14 (0.43)	-72.25 (-1.66)	-113.91 (-1.88)	119.15 (2.78)	0.868	2.08	16.75 (11,28)
5 Non-Pay Frequency 1966(i)-75(iv)	3695.6 (3.75)	-0.508 (-2.42)	13.09 (4.36)	-24.39 (-3.21)	-38.14 (-3.14)	-9.81 (-0.36)	-48.22 (-2.69)	-83.73 (-3.11)	3.87 (1.77)	94.10 (4.70)	44.43 (1.63)	37.71 (1.78)	0.656	1.99	4.86 (11,28)

Notes: Figures in brackets are 't' statistics; C_t is the constant; all other variables are as defined in the text.

[1] The unemployment variable $\dot{U}_t$ is entered in logarithmic form in the quarterly equations.

Sources: See Appendix 1.

Table 7.U.K.2. The Determinants of Wage Settlements in United Kingdom Manufacturing Industry: 1952-1975

Estimated Coefficients on:

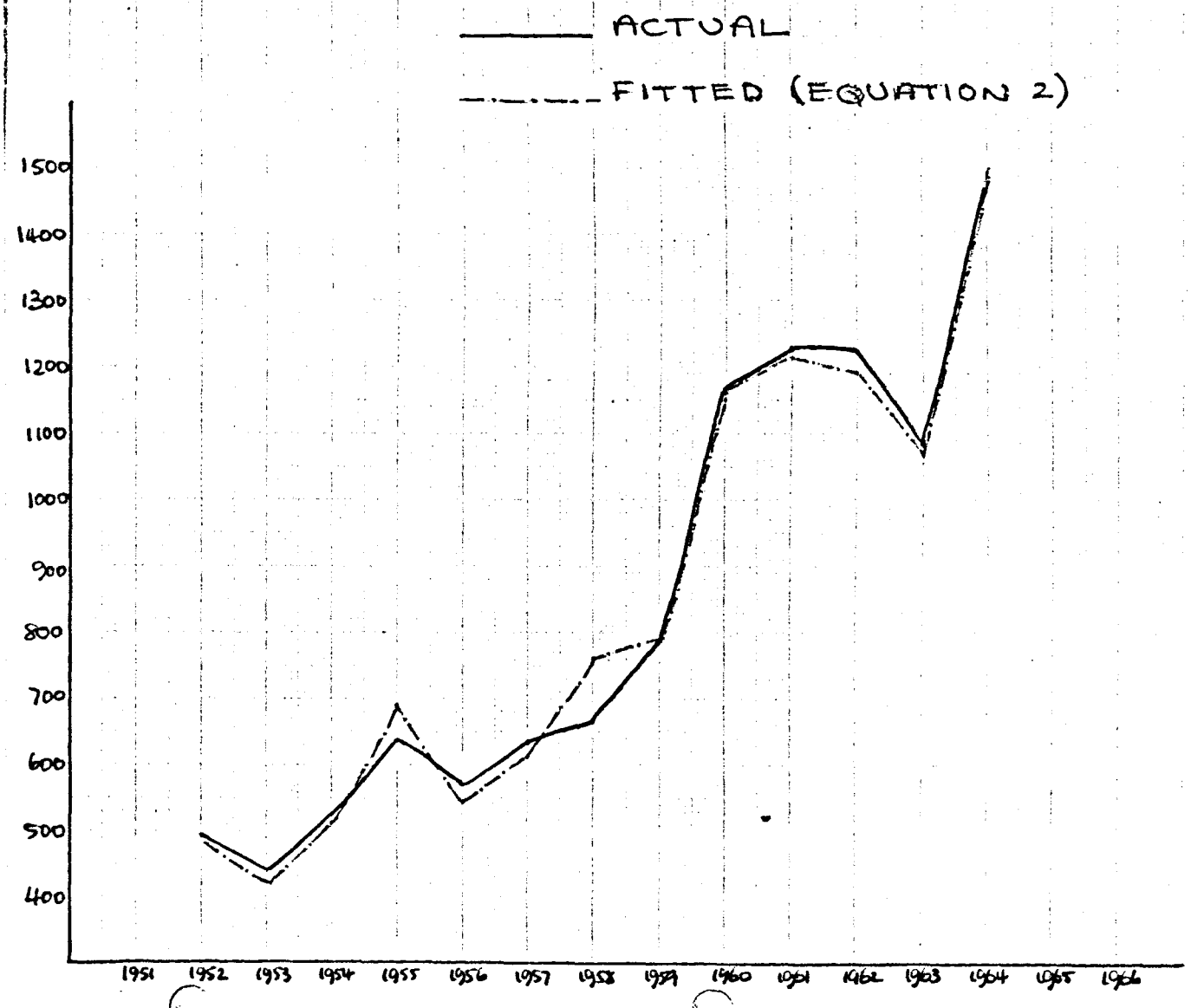
Eq.	Dep. Variable	C_t	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_t	V_t	R^2	D-W	'F' Stat	$\bar{\dot{W}}_t$
1.	Settlements	7.372	-1242.9	0.642			.788	1.72	38.98	7.51
		(3.758)	(-2.208)	(5.290)					(2,21)	
2.	Settlements (1952-1965)	0.9057	1074.24	0.213			.553	1.98	6.81	5.19
		(0.712)	(3.343)	(1.722)					(2,11)	
3.	Settlements	0.255	243.5	0.605	0.0033		.878	1.76	48.17	7.51
		(0.107)	(0.421)	(6.487)	(3.866)				(3,20)	
4.	Settlements	4.853	-782.1	0.593		0.0005	.824	1.88	31.22	7.51
		(2.445)	(-1.534)	(5.580)		(2.295)			(3,20)	

Notes: Figures in brackets are 't' statistics; C_t is the constant term; U_t^{-1} the reciprocal of the unemployment level; $\dot{P}_{t-\frac{1}{2}}$ the proportional change in the Retail Price Index lagged half a period; S_t and V_t are unlagged strike frequency in manufacturing and unlagged strike volume in manufacturing respectively.

Sources: See Appendix 1.

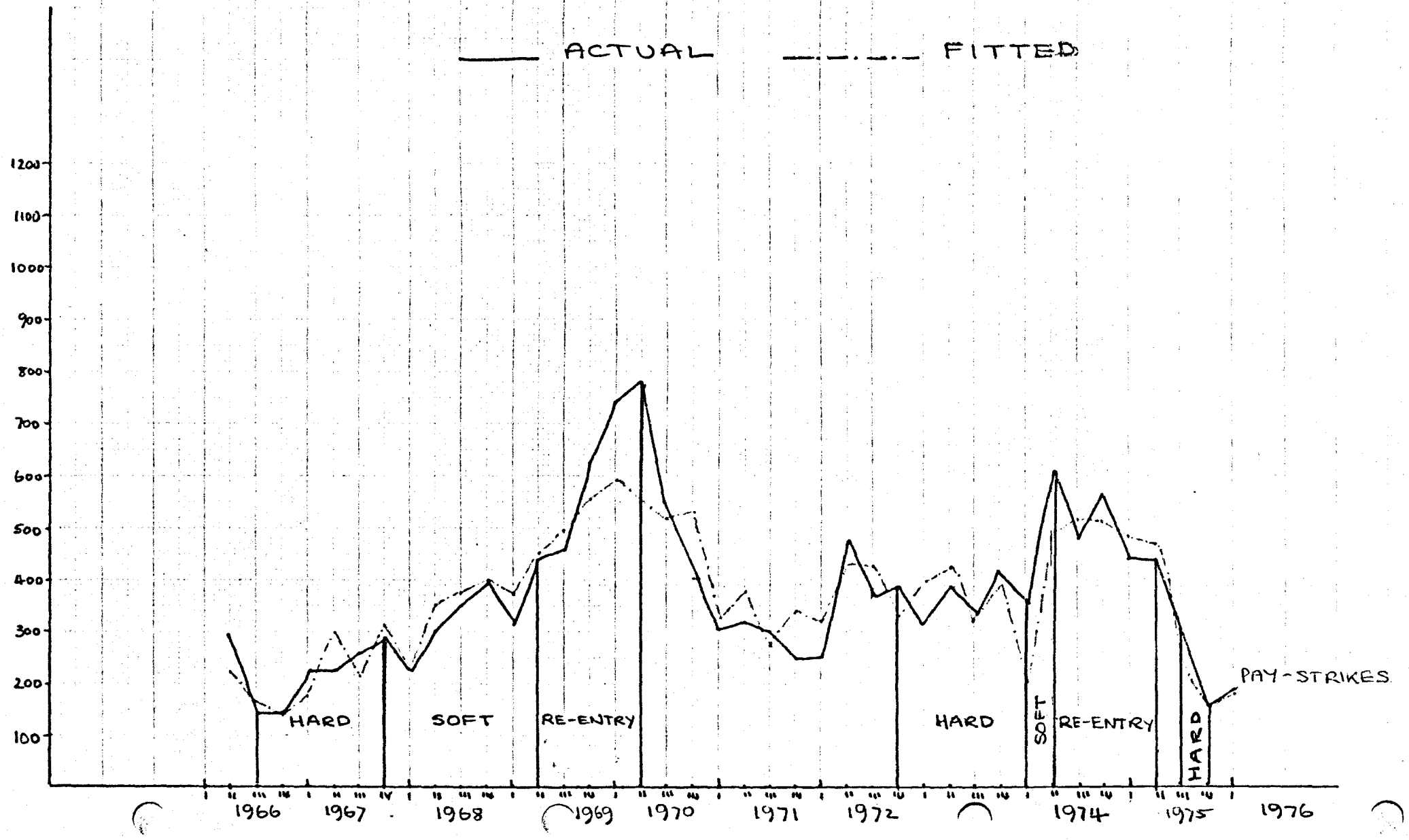
GRAPH U.K.1

UNITED KINGDOM : STRIKE FREQUENCY (EX-MINING) 1952 – 1965



GRAPH 7. U.K. 2.

UNITED KINGDOM: STRIKE FREQUENCY 1966(II) – 1976(I)



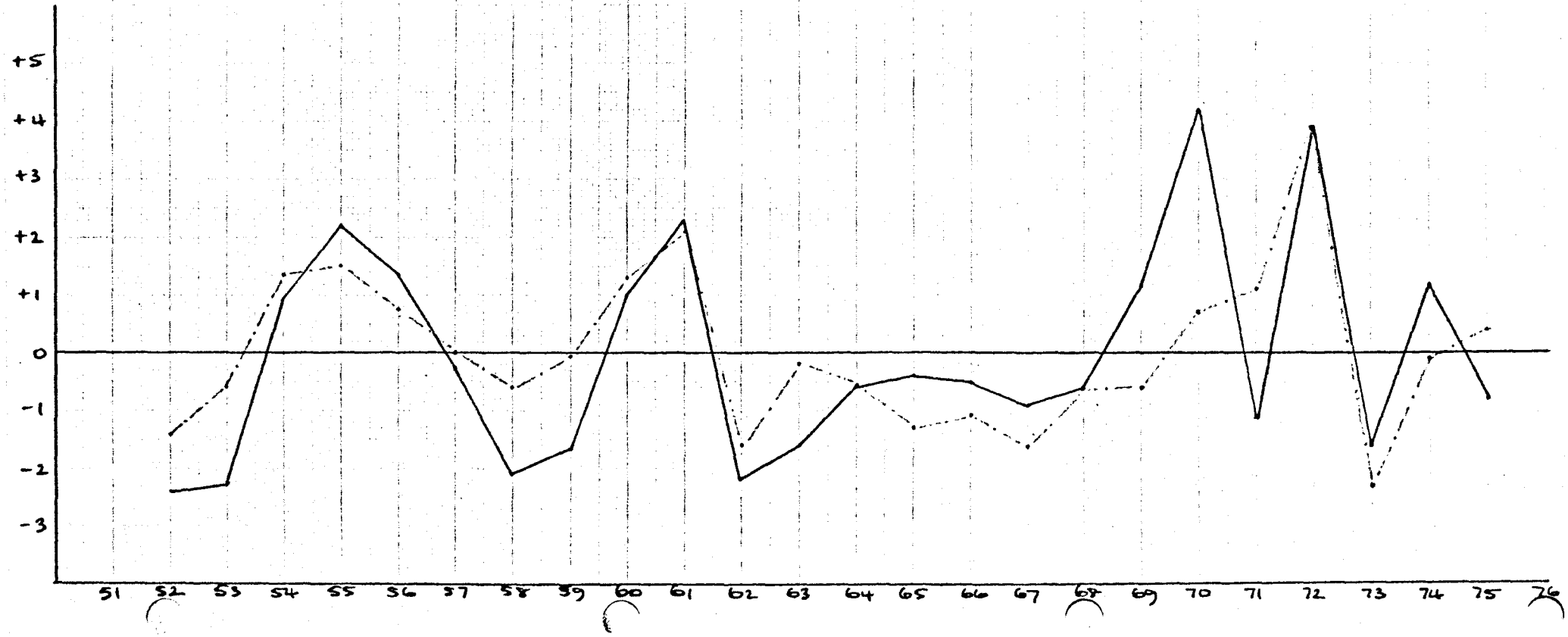
GRAPH 7.U.K.3

UNITED KINGDOM: WAGE SETTLEMENT RESIDUALS

1952–1975.

——— PRICE EXPECTATIONS PHILLIPS CURVE

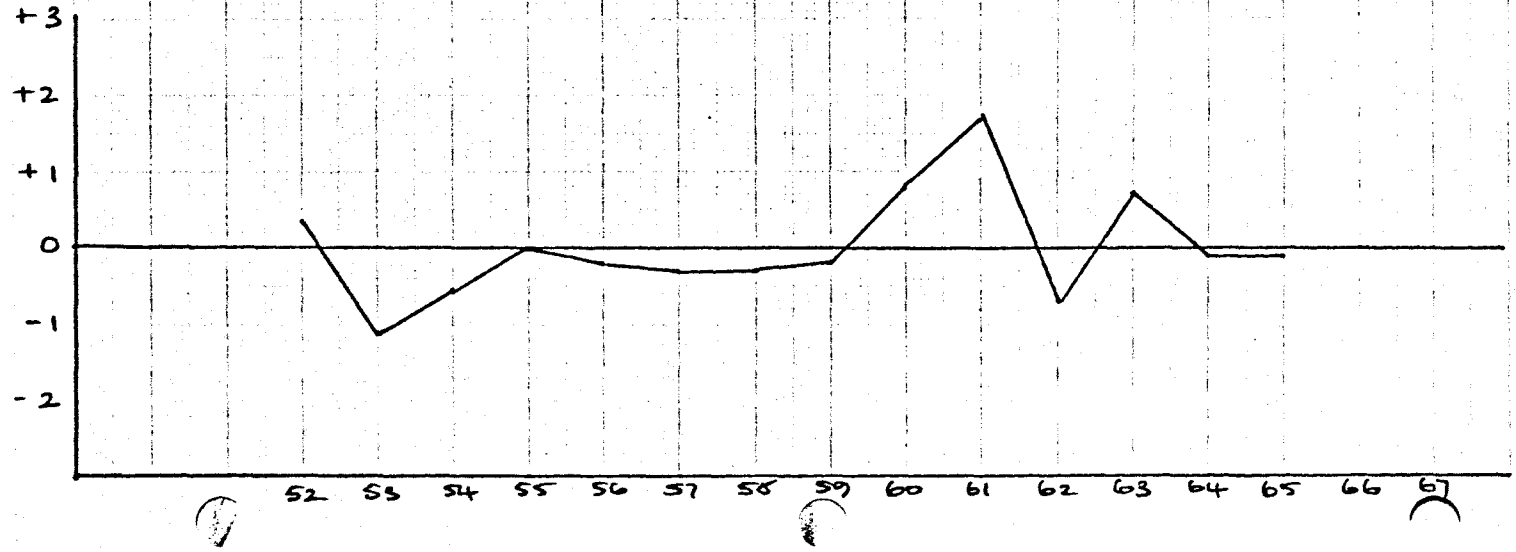
–·–·– STRIKE FREQUENCY AUGMENTED EQUATION.



GRAPH 7. U.K.4.

UNITED KINGDOM: WAGE SETTLEMENT RESIDUALS 1952–1965.

EXPECTATIONS PHILLIPS CURVE.



Conclusions

In Chapters 5 and 6 a model of the collective bargaining process was developed in which the frequency of strike action was related to the level and rate of change of unemployment, the rates of change of money wages and prices, profits, the ratio of post-tax disposable income to pre-tax income, the level of manufacturer's stocks, and finally to operational and break-down/re-entry phases of incomes policy. In addition, a model of wage determination was specified in which changes in wage rates in manufacturing were related to the inverse of the unemployment rate, lagged price changes, and the degree of rank and file acquiescence in incomes policy as proxied by a strike frequency index. The purpose of this chapter has been to test empirically this model using data derived from the member nations of the Group of Ten.

Estimation of an operational specification of the strike model reveals that strike activity is broadly responsive to economic conditions, a finding which appears true for all the industrial relations systems included in the present sample. This is clearly inconsistent with the hypotheses and evidence advanced by Shorter and Tilly (1974) and Snyder (1974 and 1975) reviewed in Chapter 3. Nevertheless, it is also apparent from the results presented in this chapter that there are significant inter-country differences in the model's performance, with marked differences in the nature of the behavioural response to economic variables under different institutional arrangements. There is also evidence of significant inter-temporal instability in these behavioural responses, particularly in the context of the Netherlands and the United Kingdom; though elsewhere, as in Canada, the United States, Italy and France, contrasts between the present findings and those of earlier studies also provides evidence of instability. It should, however, be added that this

instability has not been totally random, and appears to be predictably related in many instances to changes in the nature of the institutional environment. This finding is also at odds with work reviewed in Chapter 3: namely that of Hibbs (1976), which argues in favour of the existence of common behavioural responses to economic variables across institutionally diverse industrial relations systems.

In the context of the model of wage determination the results presented in this chapter provide solid confirmation of their responsiveness to both the state of the labour market and price changes. While this offers support to demand pull theories of inflation, it is also clear that wage changes have not been totally independent of trade union activity in all countries. Confirmation is also provided for the importance of the mediating impact of incomes policies.

Considering these issues in somewhat greater detail, it is evident from the data summarised in Table 7.1 that the state of the labour market has exerted a significant influence over strike activity in all ten countries; however the nature of that influence appears crucially dependent upon the prevailing institutional environment. In particular, where institutional features such as organizationally secure unions, well established centralized collective bargaining, and politically integrated labour movements have facilitated the emergence of cooperative incomes policies (as in Belgium, Germany, Sweden and the Netherlands prior to 1963), a significant positive relationship is apparent between unemployment and strikes. In each of these countries, except Germany (where the dependent variable is strike volume), the rate of change of unemployment is also significant, but is negatively related to strikes. These, on the face of it contradictory results are argued to be consistent with the combined influence of two aspects of the institutional environment. First , the

TABLE 7.1 *The Determinants of Aggregate Strike Activity - The Group of Ten*

Signs on coefficients on:

Country		U^{-1}	$\dot{U}$	$\dot{P}$	$\dot{W}$	$\frac{\dot{W}}{P}$	D	R	J	L	T	M	R^2	D-W
Belgium	(1953-74)	-**	-**	+**	+		-***		-***				.952	2.08
Germany	(1953-75)	-**		-**	+***		-					+**	.529	2.03
Sweden	(1953-77)	-***	-**	+***	+***					+***			.861	1.95
Netherlands	(1954-62)	-**	-**			-**	-						.771	2.26
Netherlands	(1963-75)	+***		+**	-***		-**			+***			.944	1.43
France	(1956-67; 1969-76)	+**[a]				-	-***						.810	1.89
Italy	(1956-75)	+***	+*	+	-***		+*						.870	1.55
Japan	(1956-75)	-***		+***	+***		+***						.968	2.02
Canada	(1952-77)	+***	+***	+***	+*		+*						.969	2.01
U.S.A.	(1953-74)	+***		+***	-		-***		-**				.934	2.39
U.K.	(1952-65)	+*	-***	+***	-***		+*	-**					.987	2.25
									J_1 J_2					
U.K. 1966(i)-1975(iv) (aggregate)			-***	+***			-*	-***	+ -	+***	+		.804	1.99
U.K. 1966(i)-1975(iv) (pay)			-***	+***			-	-***	-* -***	+***	+**		.868	2.08
U.K. 1966(i)-1975(iv) (non pay)			-***	+***			-***	-***	+*** +*	+***	+**		.656	1.99

Source: Table 1 Notes: *** Denotes significance at the 1% level; ** at the 5% level; * at the 10% level.

a = vacancies J, L = operational and re-entry phases of incomes policy respectively.

existence of a centralized bargaining structure which allows employers not only scope for granting discretionary supplements at plant level during periods of labour market tightness, but also the ability to remove them during periods of labour market slack - action which has the effect of precipitating (usually unofficial) protests by workers at plant level, initially of a defensive character, but subsequently, as the market improves, of a more offensive character. Second, the operation of a centralized wage policy under which union leaders are prepared to forego the full exploitation of their labour market power when unemployment is low. Elsewhere, by contrast, the predominant labour market effect involves a significant inverse relationship between unemployment and strikes. Thus, in the U.S., Canada, Italy, and the U.K. prior to 1966, low unemployment has exerted a stimulating effect on strike frequency; while in France a parallel response is found when labour market conditions are proxied by unfilled vacancies. In two cases, Canada and Italy, increasing unemployment is also associated with increased strike frequency. This is explained by reference to the greater historical orientation of organized labour in formulating their demands relative to the planning horizon of employers in these countries. Without much more detailed micro research into strikes, however, it is not clear why this result should be peculiar to these two countries.

In the context of the labour market, three countries warrent special consideration. These are Japan, the Netherlands and the United Kingdom. In Japan a positive relationship is established between strikes and the level of unemployment. This finding is attributed to the unique features of the life-time employment system operating in that country. In the Netherlands and Britain, where separate estimations are undertaken for specific sub-periods, institutional changes are associated with significant shifts in the nature of the relationship between the labour market and strikes. Thus, in the Netherlands the disintegration of national wage

policy and a shift towards more decentralized bargaining is associated with the emergence of an inverse relationship between strikes and unemployment over the period 1963-75, replacing the positive relationship of the earlier period. In the context of the U.K., the operation of some form of incomes policy over the period 1966-75 on a more or less permanent basis is associated with the disappearance of the significant inverse relationship between strikes and unemployment that characterised the earlier period. The rate of change of unemployment does, however, retain its significant inverse relationship with strikes.

Inflation appears to have been an important determinant of strikes in Japan, Canada, the United States and Britain, but not in France or Italy. In the case of France, for example, the simple correlation coefficient between strike frequency and the rate of change of retail prices prior to 1968 is actually negative ($r = -0.23$); while in Italy, though correctly signed, the coefficient on the price terms is insignificant. The latter result is undoubtedly explained by the operation of a system of wage indexation (scala mobile) during the estimating period. This explanation also appears relevant for Belgium, where the price term only obtains significance when entered in squared form, although in the Belgian context it could also be plausibly argued that the operation of social programming was instrumental to some extent in restraining trade union responsiveness to inflation. This would also appear to have been the case in Sweden, where again the price term only achieves significance when entered in squared form, and in the Netherlands prior to 1963 where the simple correlation coefficient between strikes and price changes is only 0.20. The most perplexing result is undoubtedly that occurring in Germany, where a significant inverse relationship is established between strike volume and inflation. A plausible (though admittedly ex poste) rationalization for this result is that it derives from the unions' extreme

sensitivity to the evils of inflation in the light of the experience of hyperinflation in 1923, and of the suppressed hyperinflation following World War II (Fels 1977). Reference might also be made, however, to the unions acquiescence in restraint under what has been described as 'the incomes policy from below'.

The rate of change of money wages also appears as a significant determinant of strikes, although the precise nature of this variable's impact shows considerable international variation. This result is not really surprising given the variables ambiguous a priori implications. Thus, in Germany, Sweden, Japan and Canada, money wage changes are significantly positively related to strikes. A similar relationship is evident in Belgium, but is not statistically significant. On the other hand, significant inverse relationships are apparent between money wage changes and strikes
in Italy, the U.K. over the period 1952-1965, and the Netherlands over the period 1963-1975; while a negative but insignificant relationship appears in the U.S. Finally, no statistically meaningful relationship is evident between strikes and money wage changes either in the Netherlands over the period of centralized wage policy from 1954-1962, or in the U.K. during the period of sustained incomes policy intervention from 1966-1975. These contrasting results are perhaps only to be expected, given the ambiguous a priori implications of the wage variable. Furthermore, examination of these cross-country variations in response reveals no obvious pattern as is the case with the unemployment and price variables.

Profits also appear to have an ambiguous effect on strike activity, a conclusion which again accords with the indeterminacy of the a priori restrictions placed upon the sign of this variable. Specifically, significant negative coefficients are obtained in Belgium, Germany, the Netherlands

over the period 1963-1975, France, the U.S.A. and in Britain in the context of non-pay stoppages over the period 1966-1975. On the other hand, positive coefficients are obtained in Italy, Japan, Canada and on aggregate strike frequency in the U.K. over the period 1952-1965. In terms of international patterns, it is tempting to argue that the existence of cooperative incomes policies (as in Belgium, Germany, Sweden and the Netherlands prior to 1963), or even sustained policies (as in the U.K.), has exerted a restraining influence on union propensities to pursue gains when profits are high. However, while the results presented in this chapter are broadly consistent with such a conclusion, the result is not peculiar to these countries, since the same result also pertains in the U.S., and somewhat paradoxically in the context of this argument, also in France. I could, moreover, also be argued that explanations of this type place much too much emphasis on the behavioural responses of the unions, without giving any consideration to the behaviour of employers.

The results presented in this chapter also appear highly supportive of the significance of incomes policies in influencing the incidence of strike activity. One obvious conclusion is that those countries in which cooperative incomes policies have operated with some long term success have all been characterised by comparatively low levels of collective industrial conflict. However, while the overall levels of strike activity in Belgium, Germany, the Netherlands and Sweden are significantly lower than those characteristic of the other countries in the group, each has nevertheless experienced escalations in (usually unofficial) strike activity as the result of the operation of incomes policy. In Sweden and the Netherlands this effect is proxied by the appearance of a positive and highly significant re-entry/breakdown dummy, in Belgium by a significant negative coefficient on a dummy variable entered for the period of

social programming, and in Germany (given the non-significance of simple Concerted Action dummies) by a significant positive coefficient on a rate of change of union density variable.

Incomes policies have also been of significance in the U.S. and Britain. In the U.S., for example, the operation of wage-price guideposts (1962-1965; 1971-1972) has been associated with significant reductions in strike frequency. In the U.K., on the other hand, the results of the disaggregated quarterly equations indicate that while the operational phases of incomes policy have been associated with significant declines in pay-strike frequency, they have actually stimulated strikes over non-pay issues. Indeed, in the context of hard phases of the policy (involving either outright wage freezes or severe restraint), increased strike action over non-pay issues has more than outweighed the decline in strikes over pay to produce an increase in aggregate strike frequency. In the British context, the breakdown of incomes policy has also been associated with substantial increases in both pay and non-pay disputes such that over their complete life cycle British policies have actually been associated with a significant increase in aggregate strike frequency.

In the case of Japan, France and Italy, no specific allowance is made for separate incomes policy effects, given the absence of formal comprehensive intervention in these countries. Nevertheless, in the cases of both France (in relation to the Toutée procedure),and Italy, reference to the pattern of residuals does reveal evidence of some moderation in strike frequency during periods of government exhortation in the mid 1960s,moreover in each case this moderation preceeds substantial strike explosions (1968 in France, and 1969 in Italy).

Finally, the tax variable, measured by the ratio of post-tax disposable income to total income before tax, only appears significant in the context

Table 7.2 The Determinants of Wage Inflation in Manufacturing industry - The Group of Ten

Country	Estimated Coefficients on: C_t	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	V_{t-1}	R^2	D-W	Mean
Belgium (1953-74)	-2.92 (-2.51)	473.69 (4.821)	1.162 (5.37)	0.040 (4.010)		.939 (87.39)	1.87	8.5
Germany (1953-75)	2.590 (1.239)	1198.0 (5.330)	0.542 (2.299)	0.533[+] (3.064)		.743 (18.29)	1.88	8.4
Sweden (1953-77)	1.826 (1.352)	75.46 (3.805)	0.368 (9.235)		0.0115 (5.757)	.750 (21.02)	2.07	8.6
Netherlands (1954-62)	2.45 (0.833)	158.10 (1.240)	0.564 (0.699)			.429 (2.25)	2.39	7.0
Netherlands (1963-75)	-0.172 (-0.101)	247.40 (6.085)	1.089 (5.627)			.779 (15.86)	1.44	10.5
Netherlands (1954-75)	0.0116 (0.009)	210.04 (4.710)	1.133 (7.470)			.649 (17.64)	2.14	8.9
France (1956-67; 69-76)	3.660 (3.731)	0.0352[++] (4.726)	0.585 (4.010)			.831 (39.43)	2.09	10.0
Italy (1956-75)	-2.830 (-0.735)	5311.03 (1.808)	1.235 (4.895)			.745 (24.99)	2.00	10.6
Japan (1956-75)*	-4.730 (-2.540)	0.0373[++] (6.713)	0.478 (3.806)			.834 (49.53)	2.00	13.0
Canada (1952-75)	-2.470 (0.193)	517.0 (1.933)	0.264 (2.050)	0.016 (5.353)		.866 (43.24)	2.11	6.0
US (1953-74)	3.82 (1.615)	13767.5 (6.143)	0.220 (1.970)			.834 (47.56)	2.05	4.6

(Table 7.2 contd.)

Country	C_t	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	V_{t-1}	R^2	D-W	Mean
U.K.(1952-75)*	0.255 (0.107)	243.5 (0.421)	0.605 (6.487)	0.003** (3.866)		.878 (48.17)	1.76	7.5
U.K.(1952-65)*	0.9057 (0.712)	1074.24 (3.343)	0.213 (1.722)			.553 (6.81)	1.98	5.2

Notes: + rate of change of union density

++unfilled vacancies

* settlements

**unlagged

Figures in brackets under coefficients are 't' statistics; those under the R^2 are 'F' statistics.

of the United Kingdom where it enters with a significant negative sign.

Turning to the determinants of money wage changes, it is evident from the summary of results presented in Table 7.2 that the state of the labour market, proxied either by the reciprocal of the level of unemployment, or by the level of unfilled vacancies (as in the case of France and Japan), has exerted a significant influence over wage inflation in all Group of Ten nations with the apparent exception of the Netherlands prior to 1963 and Britain since the mid-late 1960s. In both instances this apparent suspension of market forces can be traced to the operation of comprehensive incomes policies. These policies also appear to have exerted a significant influence over the wage determination process in Belgium, Germany and Sweden. Thus, in each case the best fitting equation contains an additional variable proxying rank and file acquiescence in incomes policy. Moreover, in each case the inclusion of this variable is also associated with increases in both the size and significance of the unemployment terms. This finding, which is also apparent in the U.K. equation fitted for 1952-75, suggests that trade union activity is capable of influencing the pace of wage change (in an downward as well as upward direction) independently of the level of excess demand prevailing in the labour market. Support for this proposition is also evident in the strike equations, which show a positive relationship (or, in the British case, an insignificant relationship) between the latter variable and unemployment over the relevant period.

On the basis of the estimated equations, autonomous trade union pressure also appears to have been of some significance in France, Italy and Canada; though in each case addition of a strike variable is associated with a decline in both the size and the significance of the unemployment (or vacancy) terms. Moreover, as the strike equations indicate,

fluctuations in strike activity in all these countries have been significantly positively related to the level of excess demand. In the case of France and Italy, the best assessment appeared to be that while autonomous trade union pressure has been responsible for increasing the pace of wage change on certain specific occasions, this has fallen far short of sustained or continuous upward pressure exerted independently of the state of the labour market. In the case of Canada, though the best fitting equation contains a strike frequency variable, this finding is as plausibly attributable to the widely recognized inadequacies of the unemployment rate as an excess demand proxy, as it is to the influence of autonomous union wage push. In short, it is possible that in practice the strike variable is merely acting as a further proxy for excess demand pressure, rather than as an index of union pushfulness.

Finally, reference to the price variable in Table 7.2 shows inflation to have been a significant determinant of wage changes in all countries except the Netherlands under centralized wage policy (providing further confirmation of the effectiveness of this policy in insulating wage changes from market forces). Nevertheless, substantial inter-country variation is evident in the size of the estimated coefficients. In Belgium, Italy and the Netherlands after 1963, the price coefficient actually exceeds one, a finding potentially consistent with the existence of an explosive wage-price spiral. In Belgium and Italy this absence of dynamic money illusion is undoubtedly a function of the operation of wage indexation systems over the estimation period. Alternatively, in the Italian context, and also in the Netherlands, the price term may have been biased upwards to some extent by the omission of a trade union pressure variable. For Germany, Sweden, France, Japan, Canada, the U.S. and the U.K. the coefficients on the price term are all consistent with the

existence of long-run Phillips-type trade-offs between wage inflation and unemployment. However, while this trade-off appears most pronounced in the U.S. and Canada, there is reason to expect some downward bias in the price coefficients. In particular, as Mitchell (1980) has argued, estimation of an aggregate wage equation including both union and non-union sectors, and within the union sector also wage changes from contracts of various lengths and with varying price adjustment clauses, is likely to result in a regression "with an implausibly low price coefficient".

To summarize, the findings of this chapter clearly point to important differences in the nature of the wage and strike determination processes operating under different industrial relations systems. Moreover, these differences have been shown to exert a significant influence over the responsiveness of both wage changes and strikes to variations in economic conditions. Of these effects that of most significance for public policy would appear to be that of cooperative or sustained incomes policies in mediating the influence of the labour market. However, as both strike and wage equations testify, this mediating influence has, without exception, proved highly vulnerable to attack from accummulations of rank and file protest.

Footnotes to Chapter 7

1. Earlier estimations revealed the trend term and tax variable to be insignificant (their 't' values in each case were less than one), and they were dropped from subsequent regressions. The inventory variable was omitted because of data limitations. In terms of lags, estimates were undertaken with simple one and two period lags on the wage price and profit terms, however the best fit was obtained by specifying these variables in unlagged form. While this raises the possibility of reverse causality, it is reassuring to note that in all cases the signs remained unchanged through these lagging experiments.

2. Of particular relevance in the present context is the fact that the various accords signed under social programming included union commitments to maintain industrial peace.

3. The trend and tax variables were omitted from the final equation as neither reached acceptable levels of significance in earlier estimations. In terms of lags, estimation with a simple one year lag on the real wage term (as well as its separate money wage and price components) and on the profits terms, produced the best results.

4. 'Concerted Action' dummies were included for the periods 1966-68 and 1970-72, while breakdown dummies were included for 1969 and 1973.

5. Union density in Germany is much less responsive to variations in economic conditions (including prices, unemployment and wages) than in countries such as the U.K., U.S.A., Canada, Sweden and Australia. On the latter see Bain and Elsheikh (1976).

6. Earlier estimations including a trend term and a tax variable showed that these variables did not significantly contribute to the explanatory power of the equation and they were therefore omitted from later specifications. In addition, given the short data span, a real wage variable is specified in place of its separate money wage and price components. In terms of lags, the best results were obtained by specifying the real wage term in unlagged form. It should, however, be noted that use of simple one and two period lags did not alter the sign on the coefficient. The lag on the profits variable was experimentally determined at one year.

7. The problem, of course, is the extremely small sample size. The results obtained are, however, only intended as illustrative.

8. The trend term, tax variable and the rate of change of unemployment were dropped because of their lack of significance in earlier estimations. The best fit was obtained by specifying the real wage variable in unlagged form, though lagging experiments produced consistent signs throughout.The lag on the profits variable was experimentally determined at one year.

9. This variable takes the value of one in 1963, following the breakdown of the guided wage policy, as well as in 1970 following the breakdown of the government's statutory policy.

10. See the correlation matrices in Appendix 2.

11. The trend term and tax variable were dropped after failing to achieve acceptable levels of significance in earlier estimations. In terms of lags, experimentation with simple one and two period lags on the wage and price terms produced less satisfactory results than specification in unlagged form, although the signs remained unchanged through these lagging experiments. The lag on the profits variable was experimentally determined at one year.

12. Separate estimations for strikes in manufacturing are precluded in the Swedish context by the absence of suitable data.

13. Strike statistics are not available for 1968 - the year of the major strike explosion.

14. The trend term, the tax variable and the rate of change of unemployment were dropped after failing to achieve acceptable levels of significance in earlier estimations. In terms of lags, experimentation with simple one and two period lags on the real wage and profit terms produced less satisfactory results than specification in unlagged form. Again, the signs on the coefficients on these variables remained unchanged throughout the lagging experiments.

15. As Smith (1979) has argued, regardless of the institutional character of labour-management relations, if unions have the capacity for collective action it is always a rational strategy for them to take account of labour market conditions when exercising that strategy. One caveat should, however, be entered. Namely, that under certain circumstances (such as those pertaining in Group 1 countries in Chapter 6, for example) union power may derive from sources other than the labour market.

16. See Appendix 1.

17. See Appendix 2 for full details of the correlation matrices.

18. Earlier estimations containing a trend term and a tax variable showed these variables to be insignificant, so that they were dropped from subsequent regressions. An additional variable, measuring the extent of balance of payments deficits or surpluses, and included to test the proposition that balance of payments crises may have had a restraining influence on worker militancy, also failed to reach acceptable levels of significance. In terms of lags, equations were estimated with real wage (as well as money wage and price) variables specified with one and two period lags, however, the best results were obtained from specification in unlagged form. In all cases the signs on the coefficients remained unchanged. The lag on the profits variable was experimentally determined as one year.

19. Replacement of $\dot{p}$ with $(\dot{p})^2$ did little to improve the variable's performance.

20. This should not be taken as implying that incomes policy was the sole factor precipitating this phenomenon. As Spinelli (1976) indicates

the period was also one in which deflationary policies were actively pursued (e.g. money supply growth slowed from 11.6 per cent in 1962 to only 3.7 per cent in 1967).

21. Full details are given in Appendix 2.

22. This should not be taken to imply that the industrial relations system, or the typical orientation of workers in Japan is in any sense the same as that in France or Italy. The point is rather that each shares some relevant similarities, which might have significant bearing on the effect that economic and political forces have on strikes.

23. Earlier estimations produced insignificant coefficients on the trend term, the tax variable and the rate of change of unemployment variable, and they were therefore omitted from the final equation. In terms of lags, experimentation with simple one and two period lags on the wage and price terms produced less satisfactory results than specification in unlagged form. The signs on the estimated coefficients were, however, unchanged irrespective of the lag specification. The best fit on the profits variable was obtained with a one year lag.

24. Full details are given in Appendix 2.

25. This result is consistent with the enterprise orientation of Japanese unions. The strong dependence of wages and salaries (as well as bonus and overtime payments which may amount to as much as a quarter or a third of workers' incomes) upon company profitability is emphasized in R. Komiya and Yoshio Suzuki, "Inflation in Japan" in Krause and Salent (1977).

25A. Reference might also be made to the fact that the level of unemployment in Japan has typically been low even in recessions, with working hours and hence also over-time earnings subject to more significant cyclical variations. Thus increases in strike activity during periods of recession might also be traced to protests over reduced overtime earnings.

26. Given that the present concern is with testing a model of the collective bargaining process, the ideal dependent variable is wage settlements, since these represent the immediate outcome of the bargaining activity. Unfortunately, statistics on settlements are not generally available, however in the Japanese context such a series is available in Shirai and Shimada (1978).

27. The trend term and tax variable were omitted from the final specification as neither reached acceptable levels of significance in earlier estimations. In terms of lags, the price, wage and profits variables all performed most adequately when specified in unlagged form. It should, however, be noted that the signs on the coefficients remained unchanged through these lagging experiments.

28. This problem is not confined to Canada. See, for example, the discussion of the U.K. on page 7.40 below.

29. Vacancy data, a potentially more consistent indicator of labour market excess demand is unavailable for the full period under consideration.

30. Complete correlation matrices are presented in Appendix 2.

30A. One caveat should however be added. In particular, it is possible that the strike term could be acting as an additional labour market proxy (given the unsatisfactory nature of unemployment referred to above).

31. Earlier estimations including a trend term, the rate of change of unemployment, a tax variable, and a re-entry dummy, showed that these variables made no significant contribution to the equation's overall explanatory power, and they were therefore dropped from the final equation. In terms of the specification of the price and wage terms, the best fit was obtained by entering these variables in unlagged form. The signs on the estimated coefficients were, however, unchanged when simple one and two period lags were specified.

32. Estimation of separate wage equations for the union and non-union sector does, however, indicate that in general a simple price expectations Phillips-curve view is less applicable to the union sector than the non-union sector. In particular union wages appear less sensitive to labour market conditions and more sensitive to price changes (Mitchell 1980).

33. Earlier estimations including a trend term showed the variable to be insignificant and it was dropped from subsequent regressions. In terms of lags, experimentation showed that the best results actually derived from estimations of the price, wage and profits variables in unlagged form. It should be noted, however, that in all cases the signs were unchanged through these lagging experiments.

34. The level of unemployment, the wage variable, and the stock-output ratio were dropped from the final estimating equation since none appeared significant on the basis of normal statistical criteria. The price variable was estimated using a second degree polynomial with a lag tapering to zero after three quarters.

35. Incomes policy dummy variables were specified as follows:

F_1(hard) 1966(3)-1967(4); 1972(4)-1974(1); 1975(3)-1975(4).

F_2(soft) 1966(1)-1966(2); 1968(1)-1969(2); 1974(2).

F_3(re-entry) 1969(3)-1970(2); 1974(3)-1975(2).

36. The official statistics classify stoppages by cause as follows: (a) pay (defined to include wage rates and earnings levels, and extra wage and fringe benefits); (b) trade union matters; (c) working conditions and supervision; (d) manning and work allocation; (e) dismissal and other disciplinary measures.

37. The settlement series is derived from R.F. Elliot and A.J.H. Dean, "The official Wage Rates Index and the size of Wage Settlements', Oxford Bulletin of Econ. and Stats. Vol. 40, No. 3, 1978. pp. 249-261.

38. Ideally, the strike variable should be pay-strikes in manufacturing, since as established above aggregate strike figures are not as sensitive to incomes policy (at least during its operational phases) because of the offsetting influence of non-pay strikes. Unfortunately, however, pay strike data is not available by sector.

Chapter 8

Summary and Conclusions

In the preceding chapters a variety of issues relating to the collective bargaining process, and specifically to the processes of strike and wage determination, were discussed. The purpose of the present chapter is to provide a brief summary of these issues and to outline some of the implications that may be derived from the empirical work.

The present study began with an examination of a variety of models of the economic determinants of strike fluctuations at the individual country level. Despite differences in the precise theoretical underpinnings of these models all were primarily microeconomic in orientation, that is all were explicitly derived from a basic conception of the strike as the result of a breakdown in plant level negotiations over pay. Moreover, on an operational level each was ultimately tested on the basis of a similar estimating equation. This included such familiar business cycle components as unemployment, wage and price changes and profits, though the ad hoc addition of dummy variables to represent institutional factors such as incomes policy and changes in government was also common. The great divide came in terms of the empirical significance of the explanatory variables. Thus, while something of a consensus emerged from the first wave of multiple regression analyses (Ashenfelter and Johnson 1969; Pencavel 1970; Smith 1972) in relation to the impact of the various explanatory variables in the institutional contexts of the United States, the United Kingdom and Canada; more recent findings challenged this notion in the United Kingdom (Hunter 1973; Shorey 1974). Of particular concern in this respect was: first, the apparent decline in the significance of unemployment as an 'explanation' of strike fluctuations (at a time when its explanatory power

in the context of wage changes was also called into question); and second, the inability of the conventional economic model to explain the significant escalations that occurred in the frequency of strike activity in Britain in the late 1960s and early 1970s. Britain was not, however, unique in experiencing strike explosions at this time. Indeed, her experience was shared by most other member nations of the Group of Ten. In view of this the search for factors contributing to the breakdown of the economic strike model in Britain was broadened in Chapter 3 to encompass the insights of comparative studies of strike activity.

It is at an international level that the economists' monopoly over the quantitative analysis of strike activity has been subject to the most sustained criticism. Although even here, as Chapter 3 indicated, they have not been without allies. For example, on the basis of an ambitious study of the determinants of fluctuations in strike volume across a ten country sample (Belgium, Canada, France, Italy, Japan, the Netherlands, Norway, Sweden, the UK and the US), Hibbs concluded that workers' responses to unemployment and wage and price changes were broadly the same, despite significant differences in institutional arrangements. In reaching these conclusions, however, Hibbs drew selectively, and it was argued also incorrectly, on the earlier work of Ross and Hartman (1960) in isolating the prevailing bargaining structure - and specifically the degree of centralization or decentralization of collective bargaining - as the sole institutional source of variation in the process underlying strike fluctuations. These problems were then further compounded both by errors of classification and by the inappropriate use of the technique of pooling data across countries to estimate his model. Of much more substantive significance than these methodological criticisms, however, is the fundamental challenge to the primary economic explanation of strike fluctuations provided by the work of

sociologists. Chapter 3 gave detailed consideration to two such works, namely those of Shorter and Tilly (1975) and Snyder (1974, 1975 and 1977).

Rejecting the notion that strikes can be universally treated as a purely economic weapon employed by business unions operating in atomistic markets, Shorter and Tilly advance an alternative view of the strike as a primarily political form of collective protest. This view, derived from an exhaustive analysis of strikes in France, is then used to advance a model in which strikes fluctuate not in line with economic factors, but rather in response to variations in the unions' capacity for collective action (as measured by union density), and to changes in the constellation of forces in the political arena. Following on from this, Snyder's analysis then represents an attempt to reconcile these conflicting economic versus organizational/political views of the strike. Drawing upon the earlier work of both Ross and Hartman and Shorter and Tilly, Snyder postulates three features of the institutional environment as crucial to the process underlying strike fluctuations: namely, the organizational strength of the unions; labour's relationship to the polity; and the degree of acceptance by employers of unions and collective bargaining. These features are then used to draw (an excessively rigid) dichotomy between pre-institutionalized and institutionalized labour relations systems, with the prediction that in the former the organizational political model of strikes is appropriate, while in the latter the economic model is appropriate. Empirical tests of this model in the context of supposedly pre-institutionalized systems such as these of France and Italy, and institutionalized systems such as those of the United States and Canada, are not overwhelmingly supportive of Snyder's predictions, but do nevertheless strongly question the applicability of a purely economic interpretation of strike activity in the context of Italy and France. As with the work of

Hibbs, however, theoretical, methodological and statistical weaknesses cast doubts over the reliability of Snyder's results, and hence the conclusions derived from them. Moreover, apart from the clear implication that the strike escalations of the late 1960s and early 1970s were primarily political phenomena in France and Italy, and primarily economic phenomena in the United States and Canada, Snyder's analysis is unable to cast any precise empirical light on this issue since his regressions, like those of Hibbs, stop short of the period of increased conflict.

While the choice between these rival approaches to the explanation of fluctuations in strike activity must ultimately be based upon systematic econometric tests, it is important not to lose sight of the historical context within which these strike flucuations have occurred. Thus in Chapter 4 the focus was broadened as attention was directed towards historical explanations advanced to explain one specific historical episode that has generated a tremendous amount of public debate: namely, the international strike and wage explosions of the late 1960s and early 1970s. The debate between rival explanations for this episode has provided a substantial amount of circumstantial evidence of relevance to the choice among the competing strike models. One of the most influential of these accounts was identified as the international monetarist view, which traces both wage and strike escalations to excess demand created by increases in world money supply. In terms of wages, changes are explained by reference to the level of excess demand in the labour market and to the expected rate of price-inflation; while in terms of strikes, escalations are attributed primarily to the emergence of unanticipated inflation. Trade union action in general, and strike action in particular, is thus assigned a responsive or consequential rather than an active or causal role. The relevant policy prescription for governments wishing to reduce the incidence of inflation and strikes is

control over the money supply.

The main alternative to this account was identified as the cost-push (sociological or structural) explanation; an approach which pictures inflation as a symptom of the struggle between competing interest groups over the distribution of income. In marked contrast to the proponents of the excess demand view, with its emphasis on money supply and exclusion of both collective bargaining and the wage determination process as causes of inflation, the cost-push view identifies a crucial causal role for organized labour in generating inflation. Thus trade union pressure, and the increases in wage-push inflation that it induces, are seen as the important causal mechanism in worldwide inflation. Two implications might be mentioned. First, the analysis is perfectly consistent with either an economic or an organizational/political theory of strikes. Second, the appropriate policy prescription for the control of inflation is the provision of some device for lessening distributive conflict, or directly restraining the pushfulness of organized labour. The device most frequently referred to in this context is some form of incomes policy.

With regard to the evaluation of these rival explanations, the monetarist approach possesses the distinct analytical advantage that it is able to account in a fairly convincing way for such features of international inflation experience as the simultaneous acceleration in inflation rates across countries in the late 1960s; the broad similarity in inflation rates across countries during the 1960s and their divergence since 1972; the coexistence of higher rates of inflation and high unemployment; as well as the broadly simultaneous emergence of industrial unrest. In short, the approach is able to provide an international explanation of what was undoubtedly an international phenomenon. By contrast, cost-push approaches,

with their emphasis on an essentially domestic causal mechanism,have generally failed to provide a convincing explanation for the international transmission of distributive conflict or wage-push inflation. Their emphasis on the causal significance of trade union militancy is, 'quite simply too parochial in outlook, and confuse(s) the description of inflation with the analysis of its causes', (Laidler 1975).

Though the monetarist analysis is able to provide the most satisfactory explanation of the international character of the wage and strike escalations, detailed scrutiny nevertheless revealed certain weaknesses. First, the domestic theory of inflation based upon labour market excess demand and price expectations provided unsatisfactory results in the context of the excess demand variable in Sweden and the United Kingdom; implausibly high price coefficients in Belgium, Italy and the Netherlands; and under-predictions of the actual pattern of wage changes in all countries in the early 1970s . Second, the implied monetarist theory of the strike waves - namely that they derived largely from the emergence of unanticipated inflation - though consistent with the strike models of Chapter 2, is questioned both by the timing and by the relative size of the price escalations. Third, the international transmission of inflation through the expansion of world money supply did not, in fact, pre-date the initiation of either the wage or strike explosions in 1969/70, thereby making the attribution of causality problematical. Finally, the monetarist analysis is unable to account for the fact that in Europe the origins of worker protest were based primarily at plant level, rather than in the more centralized structures of official trade unionism, or to account for the fact that the protest was in several important instances primarily unofficial.

These issues formed the basis of the alternative cost-push analysis

of Soskice (1978). While accepting a significant initial role for world money supply, this analysis also places important emphasis upon the role played by similar behavioural responses to similar economic experiences by governments, employers, unions and their members in different countries. Of particular relevance in this connection is the broadly similar response of European governments in the early 1960s to the emergence of balance of payments deficits. Thus, constrained by a regime of fixed exchange rates, the common response was the institution of some form of incomes policy as a means of restraining domestic costs. Against this background the strike and wage explosions of the late 1960s and early 1970s are argued to derive from the combined influence of a variety of frustration factors, including increased employer pressure at shop-floor level during periods of labour market slack and declining profitability, the subsequent recovery of corporate profits at a time when real wages were being eroded by increasing world prices, and finally the further restraining influence on real wage growth exerted by incomes policies into which national unions were, in several instances, voluntarily coopted. The escalation in wage inflation is then seen as a consequence of the need, perceived by employers, to 'buy-off' grass roots industrial conflict. In essence, therefore, Soskice's analysis may be seen as implying a macroeconomic theory of strikes in which the waves of the 1960s and 1970s are a function of the state of the labour market, real wage growth, corporate profitability and the impact of incomes policy; while wage changes, at least during this historical episode, emerge as significantly dependent upon rank and file pushfulness.

To summarize the implications of Chapter 4, one conclusion that emerges forcefully from both attempts to account for the international character of the strike/wage escalations is that they were primarily an economic phenomenon. In the context of strikes, however, this proposition is based

upon largely circumstantial evidence. In neither case is any attempt made to formally specify and test a model of strike activity with a view to providing quantitative evidence on either the regularity or the magnitude of the hypothesized relationships. It is this task which formed the basis of the analysis of Chapters 5 and 6. Chapter 5 was concerned with the development of an institutionally more realistic economic model in which strike activity is related to a variety of economic variables by means of a framework in which the strike decision is based upon the relative wage demands and wage offers of unions and employers, and upon variations in their respective bargaining attitudes. In this connection, the decision to strike is viewed as depending on a rational choice strategy which includes the probable political costs as well as the purely economic costs anticipated by union leaders, their rank and file membership, and employers. In the operational specification of the model emerging from this analysis the frequency of strike activity is related to a variety of business cycle components, including the state of the labour market as proxied by the level and rate of change of unemployment, corporate profits, and the rate of change of wages and prices, as well as tax induced changes in disposable income. While this specification is not substantially different from that employed in previous studies, one consequence of the attempt to achieve more industrial relations realism is greater ambiguity in the interpretation of several of the independent variables. Thus, in contrast to the economic models outlined in Chapter 2, only two variables are identified as having an unambiguous impact on strike activity: namely, price changes and the tax-induced erosion of disposable income, both of which are assumed to stimulate strike activity.

In Chapter 6 this model was expanded to include the effects of incomes policy on collective bargaining. Here it was argued that the impact

of such policies on strikes will be crucially dependent upon both the form that they take and the degree of rank and file acceptance they are able to achieve. In general, it was suggested that while operational phases of the policy might be associated with significant declines in strike activity, at least over pay; removal or breakdown, by reducing the macro political costs of striking, would be likely to provoke significant strike escalations as the inevitable frustrations caused by the policy worked themselves through the collective bargaining system.

Chapter 6 also gave detailed consideration to the influence of the institutional environment - including such factors as the size and structure of the labour movement; the maturity of collective bargaining and the level at which it is primarily conducted; and the political relationship between government and the trade union movement - on the form of incomes policy intervention. Following the pioneering study of Ross and Hartman, and in contrast to the more recent analysis of Shorter and Tilly, Snyder and Hibbs, it was argued that attention should be given to the nature of the overall industrial relations configuration, rather than to specific emphasis on any single element of that configuration. On the basis of this analysis it was concluded that three distinct types of incomes policy intervention could usefully be distinguished, each corresponding to a broadly distinct institutional configuration. Of particular significance in this connection was the argument that a configuration consisting of organizationally secure and united trade unions, well established and centralized (or co-ordinated) collective bargaining, and politically and/or ideologically integrated labour movements was compatible with the emergence of a durable cooperative incomes policy. This combination was viewed as providing, in effect, the necessary institutional supply-side conditions for some systems of durable income restraint. The demand side was then derived from the political and economic pressures placed upon governments for the simultaneous achievement of such

macroeconomic policy targets as full employment, price stability, balance of payments equilibrium and economic growth. The net outcome was argued to be the emergence of a political exchange relationship under which restraint was exercised both in the use of the strike as an economic weapon, and in the full exploitation of the union's labour market power in pursuit of wage gains.

It was this notion which formed the basis of the model of wage determination advanced in Chapter 6. The implications of this model were that during the operational phases of cooperative incomes policy official union acquiescence in wage restraint would be associated with wage settlements at a level somewhat below those that would normally occur given the level of excess demand prevailing in the labour market. This state of affairs was, however, seen as potentially unstable, being highly vulnerable to disruption from unofficial action by the union rank and file. Thus, while union leaderships were seen as willing to engage in long-term trade offs between the pursuit of wage gains in the labour market and gains in the political market, rank and file acquiescence was viewed as potentially much more vulnerable to short-term disruption from factors such as real wage erosion, disturbed differentials, and changes in labour's share in national income. In short, those factors contained in the hypothesized strike model. The obvious conclusion, therefore, is that in addition to requiring the existence of a variety of institutional supply-side pre-requisites, durable exchange relationships involving rank and file restraint also demand certain economic pre-requisites, foremost amongst which is an acceptable level of real wage growth. Where this is not forthcoming, as was largely the case in the mid-late 1960s and the early 1970s, restraint policies, even previously cooperative ones, become vulnerable to outbursts of unofficial rank and file protest. These protests were then seen as calling forth wage settlements in excess of the level which would normally have occurred given the level of labour market excess demand.

On this basis it was argued that, in the presence of sustained incomes policy intervention, the observed pattern of wage changes could only be adequately explained if account was taken of the degree of trade union acquiescence in such intervention. It was this argument which, in turn, justified the inclusion of a lagged strike frequency index in the wage equation.

The results derived from estimation of operational specifications of the strike and wage models were presented in Chapter 7. Since they have already been discussed in some detail they need not be restated here. Certain of the implications of these findings for the preceding analyses might, however, be usefully summarized: first, in relation to the explanation of strike fluctuations; and second, in relation to the rival theories of inflation.

I. Theories of Strikes

One point that emerges clearly from the results of Chapter 7 is that strike activity is broadly responsive to economic conditions. Moreover, this conclusion apparently applies regardless of the precise nature of the institutional environment, at least within the bounds of the ten countries included in the present study. This responsiveness is, however, far from homogeneous across countries [as is implied, for example, by the work of Hibbs (1976)]. Institutions clearly do matter. Thus, while it is possible to conclude that in expressing their feelings of discontent through strike action, workers and their representatives do take stock of prevailing economic conditions, their response to these conditions is far from mechanistic. More particularly, unless the institutional and normative structures of the system are taken into account, it becomes difficult to explain the specific form of action to which . . .

discontent may lead . . . expressions of discontent . . . do not occur as direct and automatic responses to objective economic conditions', (Ingham 1974; p. 36).

The danger inherent in an excessively behaviouristic approach to analysing strikes, for example by hypothesizing mechanistic responses to economic conditions on the part workers, is also clearly illustrated by the relative inter-temporal instability of several of the estimated relationships reported in Chapter 7. This was clearly evident with respect to the Netherlands and the United Kingdom, where different time periods have been associated with significant differences in the behavioural response to variables such as unemployment, wage changes and profits. In both instances these differences were associated in a fairly systematic way with the mediating influence of incomes policies.

Significant inter-temporal contrasts in worker's responses to economic conditions were also evident in France and Italy, as witnessed by the fact that the present findings differ markedly from the earlier conclusions of both Snyder and Shorter and Tilly. The most sensible explanation for these contrasts is not that these earlier contributions were wrong (though several methodological and empirical weaknesses were referred to in Chapter 3), it is rather a reflection of the fact that industrial relationships are dynamic phenomena. Thus, the present research draws upon rather more recent data than previous studies: data; that is, from a period during which important institutional developments were taking place in both France and Italy pertaining to the organizational strength of the unions, and to their use of collective bargaining as a mechanism of effective job regulation. Perhaps not surprisingly, these developments appear to have made workers' strike behaviour considerably more responsive

to economic conditions than hitherto.

Expressed in the language of sociology, the contrasts between the present findings and those of earlier studies may be viewed as merely symptomatic of an ongoing process of institutionalization of industrial conflict in France and Italy. The findings of Chapter 7 do, however, also serve to caution against acceptance of the notion that institutionalization is necessarily a unilinear process. Thus the emergence of substantial escalations in strike activity in previously 'low conflict systems' such as Belgium, Germany, the Netherlands and Sweden during the period under investigation is ample testimony both to the limits of institutionalization, and to its potential for breakdown and reversal. As Ingham (1974) has expressed it, while 'the institutionalization of industrial conflict in the form of the emergence of procedural and . . . substantive norms mediates between objective economic conditions and expressions of discontent, (it) . . . is itself vulnerable when rapid changes occur in material conditions' (Ingham, p. 37). The vulnerability to unofficial rank and file action of the 'cooperative incomes policies' established in Belgium, Germany, the Netherlands and Sweden (and more recently, also Britain), one obvious manifestation of a fairly high level of institutionalization, would appear to be a prime illustration of this process.

In the light of the foregoing observations it is misleading to suggest that the present research has in any sense established the global supremacy of a purely economic approach to the analysis of strike fluctuations. Economic influences are clearly too important to ignore, but their precise impact cannot be understood unless account is taken of the institutional environment within which these influences operate. Moreover, one key element of this environment appears to be the existence or

otherwise of some form of incomes policy.

Theories of Inflation

In terms of the rival arguments presented in Chapter 4, it is possible to reconcile at least partially cost-push and excess-demand approaches by allowing for the possibility that monetary and fiscal policies are endogenous rather than exogenous (Mitchell, 1980). That is, if it is accepted that for political reasons money supply is largely accommodative, then arguments over the role of money supply as the immediate or proximate cause of inflation become largely semantic. This, however, does little to resolve the issue of the fundamental determinants of monetary expansion. While monetarists are themselves divided on the issue, there is a tendency to concur with the view that, 'inflation is caused by governments for their own benefit' (Parkin 1975); although, it is not inconsistent with a monetarist analysis to hypothesize that union pressure is the proximate cause of monetary growth and therefore the fundamental cause of inflation, (a notion which, incidentally, forms the basis of Hicks (1955) argument that the gold standard as a constraint on monetary growth had been replaced by a 'labour standard'). Significantly, even Friedman himself has shown some degree of eclecticism on the issue, suggesting that the forces that have led governments to indulge in inflationary finance have varied so widely over time and space that it is impossible to assign primacy to any single explanation for excessive monetary growth.

While in the absence of systematic empirical evidence Friedman's eclecticism is probably the wisest course, the results of Chapter 7 do shed important light on this issue. Thus the wage equations estimated in that chapter reveal a significant independent role for trade union action

(and more specifically for rank and file pressure) in generating the wage escalations of the late 1960s and early 1970s in four countries: namely, Belgium, Germany, Sweden and the United Kingdom. All four countries were also characterized by some form of incomes policy intervention on a more or less sustained basis. Moreover, in each case the most determined use of these policies appears to have occurred during periods of social democratic/labour party rule. Thus if, as Hibbs (1977) has demonstrated, governments tend to pursue macroeconomic policy configurations that broadly favour their core electoral supporters - more specifically, if leftist governments tend to pursue full employment rather than anti-inflation policies - then money supply is clearly more likely to be accommoditive to union wage demands under such governments. On this argument incomes policies not only become easier to implement, as argued in Chapter 6, but also become more desirable as a potential means of reducing the inflationary pressure on the monetary authorities.

While 'bourgeois' governments are likely to be less amenable to the systematic pursuit of a monetary policy endogenously linked to the demands of organized labour, they are apparently not totally immune from such pressures. Thus, as the findings of Chapter 7 indicated, the labour movements in both Italy and France were able to exert significant upward pressure on wages at periodic intervals. Elsewhere, however, (particularly Canada, Japan and the United States) wage inflation appeared fairly closely linked to the level of excess demand and price expectations, with the unions acting, to use Friedman's term, 'as the thermometers registering the heat, rather than the furnace causing the heat.'

As with fluctuations in strike activity, the results of Chapter 7 indicate that in the process of wage determination, institutional factors

are of considerable significance in mediating the behavioural response of workers, their unions and employers to changing economic circumstances. One crucial factor in this context is clearly incomes policy, and analyses which ignore its effects are likely to show significant prediction errors in relation to the time series profile of wage changes. This fact, amply illustrated by the results of Chapter 7, clearly highlights the need for more adequate analyses of the political economy of wage determination rather than the further elaboration of purely economic approaches.

Appendix A.

Notes on Statistical Sources

The purpose of this Appendix is not to provide a treatise on the comparative validity of either strike statistics or the other economic data employed in this study. In the context of strike statistics this task has been addressed extensively in the literature (for example : M. Fisher,'The Measurement of Labour Disputes and Their Economic Effects', O.E.C.D., 1973; M. Shalev, 'Lies, Damned Lies, and Strike Statistics: The Measurement of Trends in Industrial Conflict' and 'Problems of Strike Measurement' in Crouch, C. and A. Pizzorno, 'The Resurgence of Clan Conflict since 1968', London, MacMillan, 1978.) While attention here will therefore be devoted largely to questions of definition, some comments are nevertheless in order in relation to the suitability of the data employed for estimations of the type undertaken in Chapter 7.

I Strike Statistics

In all cases the source of the strike frequency and strike volume statistics is the International Labour Office, Yearbook of Labour Statistics, (1950-1978). In the case of Britain, the quarterly strike statistics on aggregate, pay, and non pay strikes, and the annual statistics on aggregate strike frequency outside mining are derived from the Department of Employment Gazette, (various issues).

The first problem for any comparative analysis of strikes is that of definitional variation across countries. What does and does not constitute a strike is subject to different measurement criteria. Thus while none of the countries included in the present sample counts 'partial'

forms of industrial action (overtime bans, work to rule etc), such actions as late starts or early departures tend only to be included in the official statistics if certain minimum criteria relating to the number of workers involved, the total number of man-days lost from the dispute and the length of the dispute are fulfilled. These criteria are summarised in Table A.1.1.

Table A.1.1 Strike Definitions : The Group of Ten

	Min. Number of workers	Min. Number of days lost	Minimum duration	Political conflict
Belgium	none	none	1 day	incl.
Canada	6	10	1 day	excl.
France	none	none	none	incl.
Germany	10	†	1 day	incl.
Italy	none	none	none	excl.
Japan	none	none	½ day	incl.
Netherlands	none	none	none	incl.
Sweden	none	none	none	incl.
U.K.	10	†	1 day	excl.
U.S.A.	6	none	1 day/ shift	excl.

Source: ILO Yearbooks; Shalev (1978); Sweet and Jackson (1978).

Notes: † dispute counted if 100+ man-days lost;

excl. = excluded; incl. = not officially excluded.

These differences of definition and measurement clearly make the international comparison of strike action a potentially hazardous procedure. However, while these hazards are likely to be overwhelming with regard to the comparative analysis of strike levels, it is still possible to make meaningful statements about strike trends or strike

fluctuations. This has been the purpose of the present study. Moreover, the method adopted here has been to compare the relative performance of explanations of strike fluctuations under different institutional arrangements, rather than make direct cross-country comparisons of strike statistics.

The above approach still begs certain questions, however. In particular, the validity of the techniques employed in Chapter 7 is strongly dependent upon the assumption that measurement error within each of the countries in the present sample remains either constant or random over time. Nevertheless it is well known that strike statistics, and their definition and measurement in particular, are socially determined phenomena (Ingham, 1974). These social definitions are, moreover, subject to change. Thus in the case of Sweden, the historical neglect of unofficial stoppages was reversed in the 1970s with more recent statistics covering them much more systematically. (Korpi, W. 'Unofficial strikes in Sweden', British Journal of Industrial Relations, March, 1981, pp. 66-86). Such changes clearly question the intertemporal consistency of the official statistics. However, it is surely naive to believe that such problems are in any way peculiar to strike statistics. The major requirement of quantitative research is therefore that it employs the best data avaiable, that it explicitly acknowledges the limitations of that data, and that it cautions against too much weight being placed upon the precise values of the parameter estimates obtained in empirical testing. Thus the results of Chapter 7 should be seen as deriving their credibility as much from the consistency of certain findings across countries as from the magnitude and estimated statistical significance of the reported coefficients.

II Wage, Price and Unemployment/Vacancy Statistics

Unless otherwise stated all wage, price and unemployment/vacancy statistics were derived from O.E.C.D. Main Economic Indicators, Historical Statistics 1955-71 and 1966-79, plus individual issues. All figures are expressed as averages for the year. Specific country definitions were as follows:

Belgium

Wages: hourly rates in manufacturing

consumer prices: all goods and services, 1963 = 100

unemployment: insured persons ('000s).

Canada

Wages: hourly earnings in manufacturing

consumer prices: all goods and services, 1963 = 100

unemployment: male unemployed ('000s).

France

Wages: hourly rates in manufacturing

consumer prices: all goods and services, 1963 = 100

unemployment: unfilled vacacies ('000s).

Germany

Wages: hourly earnings in manufacturing

consumer prices: all goods and services, 1963 = 100

unemployment: registered unemployed ('000s).

Italy

Wages: hourly rates in manufacturing

consumer prices: all goods and services, 1963 = 100

unemployment: registered unemployed ('000s).

Japan

Wages: monthly earnings in manufacturing of regular workers (including bonus) - for strike equations;
Shunto wage settlements (source Dunlop and Galenson 1978) - for wage equations.

consumer prices: all goods and services, 1963 = 100.

unemployment: insurance beneficiaries ('000s); vacancies ('000s).

Netherlands

Wages: hourly rates (males) in manufacturing, including mining and construction.

consumer prices: all goods and services, 1963 = 100.

unemployment: registered unemployed ('000s).

Sweden

Wages: hourly earnings in mining and manufacturing

consumer prices: all goods and services, 1963 = 100.

unemployment: insured unemployed ('000s).

United Kingdom

Wages: hourly rates in manufacturing (for strike equation);
settlements (Elliot and Dean 1978) for wage equations.
consumer prices: all goods and services, 1963 = 100
unemployment: registered unemployed ('000s).
For the quarterly model all data was derived from Economic Trends, and in all cases is seasonally adjusted.

United States

Wages: hourly earnings in manufacturing
consumer prices: all goods and services, 1963 = 100
unemployment: registered unemployed ('000s).

III Profits Variables

Profits data in all cases except the U.K. was derived from National Accounts of O.E.C.D. Countries, 1950-1978, Vol. I. The variable is defined as operating surplus (excess of value added of resident industries over the sum of costs of employee compensation, consumption of fixed capital and indirect taxes less subsidies). Alternative specifications were deflated by total employee compensation and the retail price index to give the profit/compensation ratio and real aggregate profits respectively.

For the U.K. all profits data was derived from Economic Trends (various issues).

Tax Variable

In all cases except the U.K. the source was National Accounts Statistics of O.E.C.D. Countries, 1950-1978, Vol. I. The variable is defined as the ratio of employee compensation plus transfer or social security payments to employee compensation less taxes and social security contributions.

In the case of the U.K. the variable is defined as the ratio of post-tax to pre-tax disposable income. The source was Economic Trends (various issues).

Appendix B

Correlation Coefficients

The following tables give the simple correlation coefficients between the different regressors employed in the regressions reported in Chapter 7.

Table B.1.S Belgium 1953-1974

	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	$\dot{P}_t^2$	D_t	F_t	T
U_t^{-1}	-0.355	-0.019	0.315	-0.206	0.174	0.492	0.275
$\dot{U}_t$		0.565	0.321	0.565	-0.610	-0.218	0.491
$\dot{P}_t$			0.902	0.951	-0.676	-0.283	0.768
$\dot{W}_t$				0.792	-0.495	-0.204	0.803
$\dot{P}_t^2$					-0.575	-0.329	-
D_t						0.158	-0.980

Table B.1.W Belgium 1953-1974

	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	V_{t-1}
$\dot{W}_t$	0.316	0.826	0.726	
U_t^{-1}		-0.117	-0.020	
$\dot{P}_{t-\frac{1}{2}}$			0.562	
S_{t-1}				

Table B.2.S Canada 1952-1975

	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	D_t	T
U_t^{-1}	-0.274	-0.057	0.200	0.794	-0.802
$\dot{U}_t$		0.137	0.003	-0.176	0.200
$\dot{P}_t$			0.539	-0.227	0.404
$\dot{W}_t$				-0.187	0.536
D_t					-0.675

Table B.2.W Canada 1952-1975

	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	V_{t-1}
$\dot{W}_t$	0.200	0.790	0.757	0.655
U_t^{-1}		-0.073	-0.323	-0.300
$\dot{P}_{t-\frac{1}{2}}$			0.731	0.541
S_{t-1}				0.867

Table B.3.S France 1956-67; 1969-76

	$\dot{U}_t$	$\dot{W}/P_t$	D_t
V_t	0.340	0.502	-0.710
$\dot{U}_t$		0.464	-0.765
$\dot{W}/P_t$			-0.305

Table B.3.W France 1956-67; 1969-76

	V_t	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	WD_{t-1}
$\dot{W}_t$	0.795	0.717	0.629	0.558
V_t		0.443	0.690	0.450
$\dot{P}_{t-\frac{1}{2}}$			0.390	0.390
S_{t-1}				0.815

Table B.4.S Germany 1953-1975

	$\dot{P}_{t-1}$	$\dot{W}_{t-1}$	D_t	$\dot{M}_t$	T
U_t^{-1}	-0.063	0.188	-0.365	0.026	0.321
$\dot{P}_{t-1}$		0.660	-0.580	0.452	0.552
$\dot{W}_{t-1}$			-0.347	0.271	0.210
D_t				-0.285	-0.974

Table B.4.W Germany 1953-1975

	U_t^{-1}	$\dot{P}_{t-½}$	V_{t-1}	$\dot{M}_t$
$\dot{W}_t$	0.532	0.524	-0.096	0.377
U_t^{-1}		0.275	-0.233	0.026
$\dot{P}_{t-½}$			0.103	0.267
V_{t-1}				-0.445

Table B.5.S Italy 1956-1975

	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	D_{t-1}	T
U_t^{-1}	0.131	0.481	0.577	0.711	0.669
$\dot{U}_t$		0.203	0.220	0.261	0.344
$\dot{P}_t$			0.869	0.625	0.648
$\dot{W}_t$				0.723	0.726
D_{t-1}					0.940

Table B.5.W Italy 1956-1975

	U_t^{-1}	$\dot{P}_{t-½}$	S_{t-1}	V_{t-1}
$\dot{W}_t$	0.577	0.830	0.726	0.777
U_t^{-1}		0.435	0.661	0.648
$\dot{P}_{t-½}$			0.610	0.490
S_{t-1}				0.501

Table B.6.S Japan 1956-1975

	$\dot{P}_t$	$\dot{W}_t$	D_{t-1}
V_t	0.487	0.727	-0.110
$\dot{P}_t$		0.859	0.068
$\dot{W}_t$			-0.019

Table B.6.W Japan 1956-1975

	V_t	$\dot{P}_{t-½}$	S_t	WD_t
$\dot{W}_t$	0.859	0.732	0.900	0.663
V_t		0.512	0.735	0.448
$\dot{P}_{t-½}$			0.870	0.746
S_t				0.801

Table B.7.S(i) Netherlands 1954-1975

	$\dot{U}_t$	$\dot{W}/P_t$	D_{t-1}
U_t^{-1}	-0.529	0.674	0.382
$\dot{U}_t$		-0.387	-0.369
$\dot{W}/P_t$			0.168

Table B.7.S(ii) Netherlands 1954-1962

	$\dot{U}_t$	$\dot{W}/P_t$	D_{t-1}
U_t^{-1}	-0.600	0.513	-0.408
$\dot{U}_t$		-0.567	-0.187
$\dot{W}/P_t$			-0.369

Table B.7.S(iii) Netherlands 1963-1975

	$\dot{W}/P_t$	D_{t-1}	F_t
U_t^{-1}	0.790	0.933	0.280
$\dot{W}/P_t$		0.647	0.135
D_{t-1}			0.262

Table B.7.W(i) Netherlands 1954-1975

	U_t^{-1}	$\dot{P}_{t-½}$	S_{t-1}
$\dot{W}_t$	0.142	0.606	-0.139
U_t^{-1}		-0.464	0.476
$\dot{P}_{t-½}$			-0.529

Table B.7.W(ii) Netherlands 1954-1962

	U_t^{-1}	$\dot{P}_{t-½}$	S_{t-1}
$\dot{W}_t$	0.339	0.450	0.066
U_t^{-1}		-0.068	0.360
$\dot{P}_{t-½}$			0.204

Table B.7.W(iii) Netherlands 1963-1975

	U_t^{-1}	$\dot{P}_{t-½}$	S_{t-1}
$\dot{W}_t$	0.186	0.347	0.656
U_t^{-1}		-0.748	0.631
$\dot{P}_{t-½}$			-0.320

Table B.8.S Sweden 1953-1977

	$\dot{U}_t$	$\dot{P}_t^2$	$\dot{W}_t$	D_{t-1}
U_t^{-1}	-0.369	0.0306	0.0565	-0.0657
$\dot{U}_t$		0.0442	-0.0229	0.0009
$\dot{P}_t^2$			0.4988	-0.5729
$\dot{W}_t$				-0.2933

Table B.8.W Sweden 1953-1977

	U_t^{-1}	$\dot{P}_{t-½}$	S_{t-1}	V_{t-1}
$\dot{W}_t$	0.0482	0.6930	0.3827	0.5214
U_t^{-1}		-0.0340	-0.2312	-0.3607
$\dot{P}_{t-½}$			0.4122	0.0783
S_{t-1}				0.2276

Table B.9.S United Kingdom 1952 - 1975

	$\dot{U}_t$	$\dot{P}_t$	$\dot{W}_t$	D_t	R_t	T
U_t^{-1}	-0.5101	-0.6203	-0.5766	-0.5786	0.8334	-0.8299
$\dot{U}_t$		0.6723	0.4635	-0.1498	-0.4657	0.3225
$\dot{P}_t$			0.8974	0.1640	-0.6636	0.5628
$\dot{W}_t$				0.3216	-0.6631	0.5967
D_t					-0.7159	0.8389
R_t						-0.9708

Table B.9.W United Kingdom 1952-1975

	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_t	V_t
$\dot{W}_t$	-0.6010	0.8264	0.7226	0.6785
U_t^{-1}		-0.4205	-0.8041	-0.6403
$\dot{P}_{t-\frac{1}{2}}$			0.4173	0.4727
S_t				0.6893

Table B.10.S United States 1953-1974

	$\dot{W}/P_t$	D_{t-1}	F_t
U_t^{-1}	0.5588	0.7599	-0.1161
$\dot{W}/P_t$		0.4518	0.1798
D_{t-1}			-0.1653

Table B.10.W United States 1953-1974

	U_t^{-1}	$\dot{P}_{t-\frac{1}{2}}$	S_{t-1}	V_{t-1}
$\dot{W}_t$	0.1100	0.7806	0.5255	0.2155
U_t^{-1}		-0.1756	0.3482	0.2499
$\dot{P}_{t-\frac{1}{2}}$			0.4886	0.0448
S_{t-1}				0.4174

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